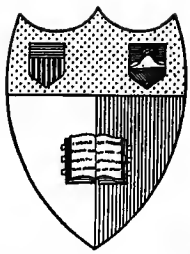
CHAOS OR COSMOS?

EDGAR L. HEERMANCE



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BY

EDGAR L. HEERMANCE

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To

N. K. L. H.

COMRADE AND
COLLABORATOR

PREFACE

Is the world in which we live a chaos, a welter of blind forces and brutish passions? Or is it a coöperative enterprise, through which Man and God are slowly working out an order of justice and brotherhood?

That is the question men are asking, with an importunity no previous age has known. We are coming to distrust Materialism. As a philosophy of life, it has been stifling moral and religious forces that are essential to progress. It offers no hope for the future. Selfishness spells exploitation and class struggle. The idea of the survival of the strong brought our generation to the World War and its terrible aftermath. We have been passing through a period of intellectual panic. Many current theories of the world have gone into bankruptcy. What is to take their place?

The relation of man to the Universe must be approached today in the attitude of the scientist. For the modern mind, knowledge is not something fixed and final, but a series of approximations. Some men still take their opinions on authority. Abstract philosophers continue to treat ideas as if they were the only realities. In this book we shall make inductions from the concrete facts given us by science and human experience.

Though not a biologist, my studies have compelled me to take the biological point of view. Man is an organism; his life, physical and mental, is a process of adaptation. To reverse Descartes' dictum: I think, therefore Something is, to which my mind is seeking to adjust itself. And that Something is the vast external Universe, which forms my environment. It is of little importance to know the exact source of our ideas. They may be built up out

of sense impressions; they may be due to revelation or to some special intuitive faculty. The real question is, what our ideas are good for, how far we can use them to know our Environment and control its forces. All fruitful thinking is a form of biological adjustment. What we call Truth and Certainty are the degree of our success.

That truth is a matter of utility is the ruling principle of what is known in the philosophic den as Pragmatism. One weak point in the work of this school should be corrected. It has had no criterion for judging whether an idea has practical value, it gave no valid reason why a theory is true because it works. There is a biological test and a biological reason. Whatever in our experience, or in the arranging of our experience, constitutes a genuine adaptation to the Environment, is true to that extent. Science and Philosophy, Religion and Ethics, are phases of the same fundamental process. They represent our human attempts to know the world and fit ourselves to its conditions. Any experience, idea or theory which enables us to do that successfully, has a survival value.

Our method carries us one step further. The conditions which determine man's adjustment in its various aspects, should throw light on the nature of the Universe. We must adapt ourselves to a particular kind of world. What is that world?

For an answer to this question, it is not enough to interrogate the astronomer or the biologist. Our survey must be as broad as life itself. A certain foreshortening in my treatment is thus explained. Much more space is given to those problems which involve man as a social unit. The earlier chapters on the natural sciences are necessary for a proper perspective, but they have been kept within a brief compass. In order to do this, I have assumed some familiarity with recent scientific progress. Detailed reviews and discussions, given in my former book on *The Unfolding Universe,* have not been repeated. To a certain extent the present volume covers the same ground.

But from an entirely different angle. Then, in seeking to understand the Universe, we led up through the Physical, Organic, and Psychological fields, to the explanation given by Religion. In this book we take the Christian religion as a working hypothesis, and test it by application to the Universe of our daily experience.

Our survey, after the opening chapters, takes on the character of a pilgrimage. We pass through various regions of human activity, stopping long enough in each to apply the hypothesis of a coöperative and moral Universe. The aim is to gain an interpretation of man's world taken as a whole, which may serve as a basis for social ethics. For this purpose a horizontal treatment is necessary. We cannot follow the vertical treatment of the historian. The function of History is to serve as the testing ground for ethical theories, rather than their source. Mr. Wells' excellent *Outline,* for example, was preceded by a long series of social studies. He had drawn conclusions as to the meaning of what man is doing, long before he tried out these conclusions through a study of what man has done. Unless one has a solid basis of ethical theory, the reading of History is largely meaningless.

I have tried to select material that is most obvious and unquestioned, avoiding controversy, speculation and prediction. If any one wishes to do battle with me, it must be on the ground of what the material means, the inductions to be drawn from it. I offer no apology for using the records of dairy cows or the elimination of yellow fever at Guayaquil as evidence on a problem in Philosophy. In studying national behavior, the attempt is made to secure completed reactions of recent date. For individual and industrial relations I have taken my examples from America, where they could be studied at closer range. Those living in other countries may cut off similar cross sections of our common world. If the tone of an American writer is more optimistic, a less clouded sky may give a clearer observation.

We shall study social experiences because of the bearing they may have on the character of the Universe. Our immediate concern is with principles rather than with programs and applications. It will be well for the reader to keep this distinction in mind. I realize how inadequate is the treatment of many questions. This is due to the necessity of keeping a balanced discussion of so wide a field, as well as to my own limitations as a student. I have sought to atone for it to some extent by concreteness, and by adding suggestions for further reading. In addition to the works cited in the text, many of the more important chapters contain selected reference lists. Books are chosen which give standard treatment from various angles, and full bibliographies. I venture the hope that many readers may be stimulated to follow the subjects I have briefly sketched. They may thus gain something of the zest of discovery which has been mine through the studies of many years.

If I fail to discuss many philosophical or theological problems, it is not because I consider them uninteresting, or unimportant, or incapable of inductive treatment, but simply because they do not fall within the scope of this book. The most notable omission is the question of Personality. Just what human personality is, and how far human analogies may be used to describe the God with whom men are in relation, is a large and complex problem. I do not mean to beg the question, but merely to postpone it, for full discussion in a later volume. When an author has the Universe on his shoulders, he may be pardoned for not carrying more of the load than is absolutely necessary.

The rapid progress of Science during the past few years makes it necessary to correct some of my former statements of fact and interpretation. This is especially true in the fields of Astronomy and Biology. The scientific material on which our discussion is based is given in more detail in the Appendix. An appendix, like a footnote, is not intended to be read by people in general. It is a

morsel thrown out to the advanced student, to divert him from criticizing the statements in the text.

My book is a series of sketches. A volume could be written on the subject of each chapter. In some cases a whole library is at our command, as I know only too well. I have not sought to strip the countryside of flowers, but to gather samples of the most characteristic. The reader might prefer another selection or arrangement. He may object to some of my attempts at botanizing. But the flowers are from Nature herself; he may not criticize them. If we do not like the facts of the Universe, we may shut our eyes; but the facts are still there.

E. L. H.

New Haven, Conn.,
December 15, 1921.

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INTRODUCTION

Man is part of a Universe, to which his life is in perpetual adjustment. In it he lives and moves and has his being. The character of that Universe—its laws and forces, its conditions of success and failure—is a matter of supreme importance to individuals and nations.

Many working theories of the Universe have been propounded. Some of these were direct attempts to explain the world, put forward by philosophers or theologians, or by scientific workers in various fields. Often the theory was little more than a fixed attitude of mind, an assumption as to the world and man's relation to it, a pragmatic creed by which actions were guided. Of these hypotheses, many have failed because they did not account for all the facts. Others furnished no sure guide to success in the practical adjustment of men's lives to the world. The theory was discredited because it did not work; the real Universe was different from what was described or assumed. A philosopher has argued from false premises, which later cause the structure of his thought to come tumbling down. A scientist has interpreted the Universe from the standpoint of his own studies, and left out of account the equally important contribution of other sciences. A ruler ignores moral laws that are as inexorable as gravitation, and ends at Amerongen or the guillotine. A workman revolutionist kills the goose which lays the golden egg. A minister of the gospel pictures the world and man as he thinks they ought to be, not as they really are, and people choose reality. A captain of industry acts on a conception of human relations which makes them mechanical instead of human, and Bolshevism lurks around the corner. The shore is strewn with wrecked

theories. In looking at the Universe, it behooves us all to see it straight and see it whole.

Like many thinkers, in many lands, I have found myself turning for guidance to the great Teacher from whom we date our calendar. The Christian religion, as a practical philosophy of life, defines God in terms of Jesus' teaching, and affirms that the Universe is on the side of righteousness and goodwill. Is this true? Does the Universe really possess such a character? That is the problem which is before us for solution. The philosophy of Jesus has the right to be tested, like other hypotheses, by experience and experiment. In fact his theory is being tested today, not only by men and women in their individual lives, but by institutions and nations. The result should prove, as far as proof is possible, whether the Universe is Chaos or Cosmos. My book attempts to gather and weigh such evidence. It is intended to be inductive in method and entirely open-minded in spirit. The Christian teaching is accepted as a working hypothesis. To learn how well it interprets the world as we find it—this is the object of our quest.

The Christian theory of the world is embodied in the teachings of Jesus. [*Chapter 1.*] Christ was a lawgiver, not in the sense of the legislator who enacts laws, but of the scientist who discovers them. The truth which he found, and proclaimed in the fact of bitter opposition, was that of a Universe essentially spiritual, the manifestation of the ever present Father. This Universe is still unfolding, and its completion requires the active coöperation of men. Both as joint creator and as the object of creation, the individual man is supremely important. The righteous and loving character of God makes integrity and goodwill, not only the basis of Ethics, but the clue to practical success.

I am increasingly impressed by the philosophy that underlies Jesus' teaching, his interpretation of the external world in terms of God as Spirit. This is more than

a doctrine of Divine immanence, as commonly understood. For a generation, we have had a growing emphasis among Christian writers on the idea of God in Nature. But Jesus appears to me to put it the other way. He does not sink God in Nature. He sees Nature as the direct activity of God. He does not sharply separate the world from its Author or Source. In a sense this is a revival of the older Hebrew attitude. It stands in sharp opposition to the dualism of God and the world which we find in later Judaism, and in the Latin stream of Christian Theology.

So much for our working hypothesis. Now let me outline the way it will be tested. Part I of our book is devoted to the Universe as a whole, without reference to the problem of the individual. The antithesis of God and His creation opened an unfortunate gulf between the religious man who emphasized God and the scientist studying the material world. Is the Universe, of which we are a part, essentially material or spiritual? This is the first of the five specific problems with which our book deals. We find a provisional answer [*Chapter 2*] in the new Physics, with its electrical explanation of Matter. The collapse of physical materialism leaves the field clear for the development of Jesus' idea of God's activity in Nature.

This conception of a dynamic Universe is common both to recent Science and to the Christianity of Jesus. [*Chapter 3.*] The idea of God emerges from the vagueness of speculative philosophy and practical dualism. If we see Him at work in Nature, arguments to prove the existence of a Divine Being become superfluous. Religion, in its historic development, is seen as part of man's reaction to the world in which he is placed, his attempt to adjust himself to the Environment and come into practical relations with it.

I call special attention to this conception of Religion, which I regard as of the greatest practical and theoretical importance. The recent attempt of Durkheim, Overstreet and others to identify God with Society, is mere theoriz-

ing. "Society" is an abstraction; it has no concrete existence outside of the individuals who compose it. Man, in his religious experience, appears to be dealing with concrete realities, many of them definitely grounded in his physical environment. He undoubtedly projects himself on the Universe. The view he takes of God is shaped by current social concepts.[1] But no one who studies the history of Religion from the biological standpoint, would be likely to develop the Society-God theory. One is led rather to the Environment-God hypothesis which I have given. There is much truth in Leuba's statement that "God is not known, he is not understood; he is used."

I leave undetermined the theological question of the relation between God and the extra-human Universe. The whole problem of Personality, human and Divine, I hope to discuss in a later book. For our present purpose the question is not material. What we want to know is whether we live in a Chaos or a Cosmos. I merely adopt Jesus' point of view, as I interpret it, and regard the Universe as one of the forms in which God reveals Himself to men. Christ teaches us to look on the external world, not as so much Matter or Force, but as itself a manifestation of the God he interprets to us, and with Whom he brings us into practical relations. This position makes the Divine Being more definite and real than where one holds to a sharp dualism of God and the world. At the same time it brings Religion, Science and History onto a common plane, where relation and logical induction are possible. If, at some points in the book, I appear to identify God and the Universe, this use of language is intended as rhetorical rather than philosophical.

To resume the thread of my argument, Man in his communion with Nature [*Chapter 4,* a breathing spell from intellectual problems], has found therein a solace, a spiritual symbolism, and a mystical exaltation.

[1] See my *Unfolding Universe,* chap. 18, The Social Stages of Religion.

Our idea of the Universe has been enormously expanded by modern Astronomy. [*Chapter 5.*] This introduces a question of proportion, with regard to the earth and man. [*Problem b.*] The external world is still a unity. And in this larger perspective, human life retains its intrinsic value. The evidence at hand leads us to reject the possibility of other inhabited worlds, from which the life of our planet might have been derived. We are thus thrown back on the current scientific conception of life, as a more complex development of the phenomena which we know as physical. This position is in harmony with Jesus' idea of Matter as an expression of God's activity.

The long evolution of life on our planet culminates in the appearance of Man. [*Chapter 6.*] Was this a cosmic accident, or was it a natural result of the forces involved? In other words, are we to accept the Christian postulate of a definite goal in Creation? [*Problem c.*] The facts do not bear out the idea of God as an Engineer operating upon a world entirely distinct from Himself. Recent Biology, however, appears entirely consistent with a dynamic Universe unfolding from within.

In Part II we take up the question of the Individual. Is the Universe a strict Monism, in which the individual human being is submerged? Or, as Christianity affirms, has the Monism of the extra-human world become a Pluralism, a Republic of coöperating wills? [*Problem d.*] This problem is of so much practical importance, in view of certain tendencies toward philosophical absolutism and religious pantheism, that considerable space is devoted to it. We waste no time discussing such abstract questions as the nature of the will, or freedom versus determinism. Taking man as an organism, in constant interaction with the Universe which forms his Environment, we merely ask what difference he is able to make in the net result. Man's part in Creation is sketched, and the nature of various human functions and activities. [*Chapters 7 to 12.*] We find cumulative evidence that man, in his men-

tal life, is not a part of God, but rather a unit actively coöperating with God.

Part III deals with the problem of Morality. Is the Universe to which man is seeking adjustment, and with whose forces he is coöperating, to be considered as righteous and beneficent? [*Problem e.*] Here again the evidence is sought in the concrete rather than the abstract. Section 1 covers Individual Relations. [*Chapters 13 to 15.*] Through a study of human behavior we seek to determine the conditions in society which bring to the individual the most favorable reaction. A review of personal and business relations shows that man is succeeding in proportion to his recognition of character and mutual service. Altruism, in the sense of trust and goodwill, is seen to be an outgrowth of natural human instincts, which form the basis of our social and economic life. Similarly, self-control, honesty and justice must be regarded as community assets. Jesus appears to be justified in extending honor and goodwill from narrower groups to society as a whole. His conception of the laws and conditions of the Universe is thus confirmed. Human society becomes a higher form of coöperation between men and God, which finds expression in the Christian conception of Prayer. [*Chapter 16.*]

This idea of righteousness and goodwill as expressing the character of the Universe, must be tested in the field of broader human relations. The case method of Behavior Psychology enables us to study modern Industry objectively and without conscious bias. [*Section 2, Chapters 17 to 19.*] Our object is to determine the industrial conditions which have produced the most favorable physical and moral reaction on the part of the worker. The failure of exploitation, whether on the side of Capital or Labor, and the success that has followed experiments along the line of common interest, give strong confirmation to Jesus' interpretation of the world.

In applying to the life of Nations [*Section 3, Chapters*

20 to 23] the same psychology of Behavior, we are breaking ground in a new field. The brief study which we are able to make of national aggression, colonial management, and the treatment of other peoples, indicates reactions parallel to those in the industrial group. This result, even if only tentative, is of the greatest importance. From a practical standpoint, the object of a nation must be to act so as to secure favorable reactions from other nations or from subject races. Turning to theory, we see that there are moral laws of the Universe, which, like the laws of mechanics or the laws of health, may be learned through experience and experiment. And these laws apply to nations as well as to individuals. The growth of commerce has brought a rapid unification of the world. [*Chapter 24.*] In national relations, whether official or unofficial, the Christian principle of common interest finds increasing application.

Summing up the evidence [*Chapter 25*], we find that the Christian attitude toward the Universe is essential to modern civilization. Social progress is an achievement rather than an evolution. Through a slow and painful struggle, the race is learning to adjust itself to its Environment. The advance which has come through man's knowledge and control of physical forces, only brings into sharper relief his relative failure to know and control the moral forces of the Universe. The true function of the individual is found in his position as an independent and coöperating unit. He is partner in a democratic cosmic enterprise. And the objective of the age-long coöperation between Man and God is the developing of human personalities. Promise of advance along this line is seen in the lengthening of human life, the spread of democracy, and the social solidarity introduced by the Industrial era.

And now, having spread out the menu, and as I trust whetted the reader's appetite for what is to follow, let us on with the dinner.

CHAOS OR COSMOS?

CHAOS OR COSMOS?

I.

PRELIMINARY: JESUS' VIEW OF THE UNIVERSE

When the scientist faces a problem, he forms a working hypothesis, and tests this by further observation and experiment. In considering the question of Chaos or Cosmos, I propose to follow the same method. We shall start with the idea that the Universe is an ordered Cosmos. To make the idea more definite, let us take as its representative the consistent and thorough-going statement found in Christianity. The present chapter will develop this hypothesis in some detail. In the remainder of the book, we shall be occupied with testing Christianity as a working theory.

The place to study the Christian idea of the Universe is at its source. Increasingly there is borne in upon the student the freshness, the modernness of Jesus. Though the imagery of his statement is ancient and Oriental, he seems to think much as we do today. This impression is not merely subjective, or a result of our recovery of the real Christ, beneath the whitewash of dogma. Nor is it enough to say that the universal form in which Jesus' teaching is cast, has led each age to think of him as modern, from its own viewpoint. We think in similar terms, because the world of today is facing many of the same social conditions and problems which Jesus faced in the Roman Empire of the first century. Again, our modern world is largely his creation. The civilization developed

in Europe since the close of the Middle Ages owes to Jesus many of its formative ideas and emphases. Once more, the progress of the natural and social sciences during the past few years, has confirmed in a striking way certain of Christ's most fundamental positions, as will appear in later chapters. Whatever the source of Jesus' teaching, the Master of men, to whom we trace our Christian civilization, must rank as one of the great leaders, not only in Religion and Ethics, but in Constructive Thought.

Jesus was not a philosopher in the professional sense. He was unfamiliar with the methods and teaching of the Greek schools. His interests were practical rather than theoretical. But in working out a program for the betterment of humanity, he has given us the outlines of a well-rounded theory of the world, an hypothesis capable of practical testing and proof.

Questions of literary criticism cause little difficulty. Leaving out parallel passages, probably seventy-five per cent of the material could be rejected, without affecting the net result. Jesus' main principles are found in all our sources. Comparative study enables us to make allowance for editorial revision, and for the bias with which his words are reported by one or another. The chief problem is to rid ourselves of preconceived ideas and of theological bias. Some appreciation of Oriental imagery is needed, and a strong sense of humor, since many of Jesus' statements are in the form of droll exaggeration. Following Jülicher's warning, the parables must be used primarily for the truths they were intended to teach, and only with great reserve for indications of Jesus' attitude on other questions. In many instances we find phrases and images which appear inconsistent with Christ's general philosophy of life. If correctly reported, he used them either because they were current, and so an excellent vehicle for teaching, or because his thought had not been worked out in logical detail.

We are concerned only with the philosophical or social

aspects of Jesus' teaching. These however made up the bulk of his interest. He talks of God not as Pure Being, but in relation to men. Personal salvation is closely wrapped up with one's part in the Kingdom of God. Jesus assumes a future life, but his immediate concern is with the present life. I distinguish five main principles, around which his teachings may be grouped.

1. *The world in which we live is Divine. God is here. We can detect His presence in Nature, and in human life. His rule is a fact of daily experience.*

Let us look first at Jesus' attitude toward Nature. His teachings are full of loving references to the natural world, which show how closely he had observed it, how much it meant to him. The sunset, the lightning, the mustard seed, the harvest, the nesting birds, the foxes—these form the basis for his homely parables and figures of speech. From the pages of the natural world, Jesus reads the story of the spiritual world. The wind blowing where it listeth is not merely a wind. It tells him of the breath, the spirit of God, coming, going. Sheep on the hillside are more than sheep; they are the poor humans he is trying to shepherd. The branches of the grape suggest the vital relations between men and God.

It is to Nature that Jesus turns when he wishes to be alone, alone with God. He seeks out some mountain, some wilderness, some lonely garden. There he wrestles with temptation; there he renews his strength; there he agonizes in the crises of his life. Often Jesus takes the disciples with him. "Come away to some wild spot," he says, "and rest awhile."[1] Peter's confession is brought out amid the mountain scenes near Cæsarea Philippi. This communion with God through God's world appears to have been a habit with Jesus.

Not only is the physical world symbolic. Not only is Nature a solace, and its silences the best approach to God. But this natural world itself is God's world, throbbing

[1] Mk. 6:31.

with Divine life, filled with God's activity, revealing the loving Father's thought and care. It is God who adorns the lilies. The sparrows are fed by Him; not one falls to the ground without the Father. For Jesus, as Stapfer has said, the natural world is transparent, and through every part of it, every event, shows the Divine Face. Not an impersonal First Cause. Not an absentee God. But the Father, living, near, beneficent. This attitude toward the Universe has its practical side. Though sharing the limitations of our common humanity, the Master does not despair of his daily bread, even when there is no visible means of its coming, shows no fear in the face of the tempest on the Lake of Galilee, never sees in Nature anything terrible or cruel.

This note is heard frequently in earlier Hebrew literature. Something of the same mystical element was undoubtedly present in the Pharisaic teaching, at its best.[2] But the average pious Jew of Jesus' day appears to have held a dualism of God and His world, which tended toward externalism and materialism. God lived above the sky, far removed from the world of His creation. This holy and awful Being, whose very name was too sacred to speak, acted on the world through His "Spirit," "Wisdom," or other intermediary. His intercourse with men was carried on by angel messengers. God's will was law. And this Law had been revealed in sacred writings, which, by statement or inference, regulated the life of the chosen people in its minutest detail. For the common man, the emphasis, both in worship and conduct, was on the external and physical. Religion was to him no longer a joy, a good news, but a system of forms and rules, which only the elect few were able to learn or carry out in their completeness.

Views as to the future were various and changing.

[2] See R. T. Herford, *Pharisaism*, 1912; C. G. Montefiori, *Some Elements of the Religious Teaching of Jesus*, 1910; S. Schechter, *Some Aspects of Talmudic Theol.*, 1910.

Man's life practically ceased with the death of the body, though the soul was considered to be sleeping, or continuing a shadowy existence of happiness or misery in the underworld. In the Resurrection, however, the body would be revitalized and take part in its old activities.[3] The good Jews would reign with the Messiah in a glorified but still earthly Jerusalem.[4] The godless would be cast into darkness and never-dying fire, either in Jerusalem's city dump in the Gehenna valley, or in some celestial parallel. Further speculation had begun to merge the national hope into a world conflict between God and Satan. Present and future stood in sharper antithesis. With the final victory for the Kingdom of God, the sky and earth would pass away. In their place would come a new order of existence, still conceived as material in many of its features. The heavenly Paradise, where the saints would dwell with God, was to be separated by a great gulf from the abode of the wicked. As yet the earth remained in the hands of demons and other powers of Darkness, who were the cause of sickness, Roman tyranny, and other human woes. There was little hope of improvement, except through the intervention of God on a cataclysmic scale.[5]

Jesus' spiritualistic philosophy is in striking contrast. God is Himself the ever-present Spirit, who may be worshipped in any place.[6] He sees in secret, and is interested in attitude and motive rather than external forms.[7] Jesus makes it clear that moral uncleanness is of the thought, not of the hands.[8] Our relations with God are personal;[9] they are not on a business basis.[10] He is the giver of

[3] Compare the Sadducees' reduction to absurdity in Mk. 12:18-23.
[4] Matt. 20:21; Acts 1:6.
[5] See W. Bousset, *Relig. des Judentums im neutestamentliche Zeitalter*, 1903. An excellent summary is given by G. Hollmann, *Jewish Relig. in the Time of Christ*, Eng. trans., 1909.
[6] Jn. 4:21-24; Matt. 18:19-20.
[7] Matt. 5:21-37; 6:1-18; Mk. 2:23-27.
[8] Mk. 7:14-23; Lu. 11:37-41. *Cf.* Matt. 5:27-28.
[9] Matt. 6:1-18.
[10] Matt. 20:1-15.

food,[11] of health,[12] of life,[13] of character,[14] of wisdom.[15] The test of living is life.[16] Spirit is vastly more important than body.[17] The only death with which Jesus is specially concerned is the loss of character.[18] Life will go right on without a break,[19] future existence being an emancipation of man's spirit from the limitations which the body imposes.[20]

For Jesus, the kingdom or rule of God is not merely a hope and an ideal, but a present reality. It is at hand,[21] actually among men.[22] People are pressing into it.[23] The Kingdom is the world's harvest field,[24] the seed of the future,[25] the thing of greatest present value,[26] the first claim on a man's interest.[27] Already it belongs to the receptive in spirit, and to those who have suffered for the great cause.[28] Jesus recognizes the weaknesses and failures of humanity, in the world as we find it.[29] But his vision of the rule of God already begun, his confidence in its future triumph,[30] has made him the great optimist of history. We find denunciation and plain speaking, on occasion, but no trace of cynicism, or of the censoriousness that so often characterizes the reformer.

[11] Matt. 6:11; Mk. 6:41.
[12] Mk. 9:29.
[13] Jn. 10:10; 5:40; 14:19.
[14] Matt. 6:13.
[15] Matt. 10:19-20.
[16] Matt. 7:15-27.
[17] Matt: 4:4; 6:25; Lu. 12:15; Jn. 3:6.
[18] Matt. 10:28; Jn. 6:63.
[19] Mk. 12:26-27; Jn. 5:24; 8:51; 14:1-3; 11:23-26, a striking contrast with the current Jewish view of resurrection.
[20] Mk. 12:24-25.
[21] Mk. 1:15; Lu. 10:11.
[22] Lu. 17:20-21; Matt. 12:28; 11:11.
[23] Lu. 16:16; Matt. 11:12.
[24] Matt. 13:37-38.
[25] Matt. 13:31-32; Mk. 4:26-29.
[26] Matt. 13:44-46.
[27] Matt. 6:33.
[28] Matt. 5:3, 10.
[29] Matt. 13:18-30; Lu. 17:1.
[30] Mk. 9:1; Matt. 26:29; Lu. 10:17-18; 21:27-28.

With Jesus' sense of God's real presence, goes a joy in living, an appreciation of wholesome physical pleasure, a love of social fellowship, a breadth and fulness of life, which remind us of the Greek religion at its best. Such an attitude is like a burst of sunlight, by contrast with the austerity of John the Baptist, or the cold formalism of the average scribe.[31] Asceticism appears out of place in Christ's religion.[32] He recognizes scholarship, and endorses the search for truth.[33] He shows the true gentleman's regard for proper conventions.[34] This genial temper made Jesus welcome with people of all classes. Combined with his self-forgetful service, it brought him a personal popularity that often proved embarrassing.[35]

2. *Creation is incomplete. The Divine Universe is a thing of slow but certain growth.* This idea of development is suggested by Jesus in a number of passages. He himself applies it in fulfilling, that is spiritualizing, the Mosaic code.[36] Christianity is a new garment, not a mere patching of the old.[37] The Kingdom of God is like yeast, like the mustard seed,[38] the growing wheat.[39] To him that hath will be given.[40] God's spiritual order increases like money well invested;[41] it represents a gradual achievement.[42]

3. *This unfolding Universe takes its character from God.*[43] *Jesus represents and reveals Him.*[44] We are left

[31] Matt. 11:16-19; Jn. 10:10; 15:11.
[32] Matt. 9:14-15; 6:16-18.
[33] Matt. 13:52; Jn. 16:12-13; 8:32.
[34] Lu. 7:36-50; dress, Jn. 19:23; church dues, Matt. 17:24-27. Contrast with fasting, Lu. 5:33-39; ablution, Mk. 7:1-23; Sabbath, Mk. 2:23-3:6.
[35] Mk. 2:15; 12:37; 5:24; 1:36-38; Jn. 12:12-19; 6:15.
[36] Matt. 5:21-37; 19:8.
[37] Mk. 2:21. *Cf.* Matt. 11:11.
[38] Matt. 13:31-33.
[39] Mk. 4:26-29; Jn. 12:24; Matt. 13:3-9, 24-30.
[40] Mk. 4:25.
[41] Matt. 25:14-30; Lu. 19:12-27.
[42] Matt. 6:10; Lu. 10:9; 11:20.
[43] Matt. 6:25-33.
[44] Matt. 10:32-33, 40; Lu. 10:22; Mk. 9:37; Jn. 5:17-47; 14:9.

with a very definite picture of the moral order in the world.

God is on the side of integrity.[45] Those who hunger and thirst for righteousness will be satisfied.[46] Purity of thought is the door to God.[47] He stands for justice,[48] for fidelity,[49] for courage,[50] for self-control,[51] for honorable peace,[52] for consideration.[53]

The heavenly Father loves, and expects love in return.[54] God is not a Despot, but the daily, hourly servant of humanity.[55] He shows special interest in childhood.[56] He sympathizes with hunger,[57] with exhausting labor,[58] with poverty,[59] with worry and fear.[60] God has compassion on the ignorant and unorganized,[61] on the sick,[62] the handicapped,[63] the sorrowing,[64] the sinful.[65] In fact He identifies Himself with human weakness and need.[66] God yearns to save.[67] He expects men to share His sacrifice.[68] Good deeds are an advertisement of the Divine order in the world.[69]

God's world is essentially social. Jesus' hope is that

[45] Matt. 5:17-20, 48; 21:12-13.
[46] Matt. 5:6.
[47] Matt. 5:8, 27-32.
[48] Mk. 7:6-13; Matt. 5:23-24; 23:1-36.
[49] Lu. 12:35-48; Matt. 25:21.
[50] Matt. 5:10-12; 10:22, 38.
[51] Matt. 5:21-22.
[52] Matt. 5:9, 25-26.
[53] Matt. 5:7; 6:14-15; Lu. 6:36.
[54] Matt. 22:37-38; Jn. 14:21.
[55] Matt. 5:44-45; 6:25-33; 7:7-11; Lu. 22:24-27.
[56] Lu. 18:15-17; 17:2; Matt. 18:10, 14.
[57] Mk. 8:2; Matt. 25:35.
[58] Matt. 11:28-30. *Cf.* Mk. 6:3; Jn. 5:17.
[59] Lu. 6:20; Matt. 11:5; 25:36.
[60] Matt. 6:25-34; Lu. 12:4-7; Jn. 14:27.
[61] Matt. 9:36.
[62] Mk. 5:22-34; Matt. 25:36.
[63] Jn. 9:1-39; Matt. 9:27-30.
[64] Matt. 5:4; Lu. 7:13; Jn. 11:33-36.
[65] Matt. 9:10-13; Lu. 7:47-50.
[66] Mk. 9:37; Matt. 25:45.
[67] Lu. 15:1-32.
[68] Matt. 16:24; Jn. 12:25-26.
[69] Matt. 5:13-16.

men may be united with one another and with God.[70] The model prayer is addressed to "our Father," not "my Father." This term itself is full of social suggestion. The sins with which Jesus is specially concerned are those that tend to break up the Divine family: hatred, lust, pride, covetousness, censoriousness, bad influence, selfishness, injustice.[71] The "unpardonable sin" is shown by the context to be the denial of the spirit of service.[72] God's program for the world is a social program.[73] The term "Kingdom of God" occurs over a hundred times in the gospels, including parallels. Jesus' use of the phrase suggests a republic rather than an absolute monarchy.[74] Religious institutions are of value to the Father in proportion to their value for man.[75]

God's interest, however, is in the individual and not the mass.[76] Salvation is no national or racial reunion.[77] He feels as the shepherd does toward the one lost sheep out of the flock of a hundred, or the housewife toward the single coin.[78] The very hairs of our head are numbered.[79] The human soul outweighs the whole material world.[80] One little child may represent God, as the object of our service.[81] The individual will persist after the death of the body.[82] This emphasis in Jesus' teaching corresponds with his own case method. One of the Master's great achievements was his valuation of the individual, not merely as a social unit, but for his own sake, as a child of God.

[70] Jn. 14:15-20; 17:11, 23.
[71] See Matt. 5:21-48; 18:1-9; 23:1-36; 25:31-46.
[72] Matt. 12:22-32.
[73] Lu. 4:16-21; 7:18-23.
[74] Matt. 17:24-26.
[75] Mk. 2:27-28; Matt. 12:1-8.
[76] Matt. 18:5-6, 12-14.
[77] Matt. 8:10-12; Jn. 8:33-44.
[78] Lu. 15:1-10.
[79] Matt. 10:29-31.
[80] Matt. 12:12; 16:26.
[81] Matt. 10:42; 18:5; 25:40.
[82] Jn. 5:28-29. *Cf.* Lu. 16:19-31.

4. *The completion of the world requires the coöperation of the Father and His human sons.* At one end of this relation, fruitful living demands close touch with God.[83] Human intelligence depends on God-given intuition.[84] He is the source of all possessions and endowments.[85] It is God's Spirit which must change the unsocial man into a good man.[86]

On the other hand, human activity and enterprise are essential.[87] Deeds are the road to truth, to love, to stability of character.[88] Jesus makes the disciples partners in his program.[89] He shares to some degree his remarkable control over natural forces,[90] and over the human body.[91] Faith on the part of the patient is a condition of Divine healing.[92] It is the attitude of trust which gives free access to God's riches and power.[93] Practical social service is expected of every man, in the course of the day's work.[94] The realization of God's rule is wrapped up with such human endeavors.[95] Workmen are encouraged to yoke up with God.[96]

Providence is coöperative. The man born blind is not a case of kismet; he was not being punished for his sins or those of his parents. His blindness was there to be cured. It was a defect in God's world which God was eager to see remedied.[97] An accident calls for repentance on the part of the community.[98] Increased food supply

[83] Jn. 15:1-8.
[84] Mk. 13:11; Jn. 16:7-13.
[85] Matt. 6:33; 25:14-30.
[86] Jn. 3:3-5; Matt. 12:32-35.
[87] Matt. 7:7-8.
[88] Jn. 7:17; 14:21; Matt. 7:21-27.
[89] Jn. 17:18; Matt. 28:18-20.
[90] Mk. 11:20-23; Jn. 14:12; Lu. 10:19.
[91] Matt. 10:1, 8; Lu. 10:9.
[92] Matt. 9:22, 29, etc.
[93] Matt. 6:25, 33; Mk. 11:22-24.
[94] Matt. 25:31-46; Lu. 10:25-37; Matt. 10:42.
[95] Matt. 6:10; 10:7-8.
[96] Matt. 11:28-30.
[97] Jn. 9:1-5.
[98] Lu. 13:1-5.

requires human coöperation.[99] Man has a part in forgiveness,[100] in sweetening human relations.[101] Marriage is a sacred relationship, to be shared by all who are able to share it. The alternative is absolute control over sexual instincts and imaginations.[102] Men will be held responsible for wrong moral conditions, particularly in the case of the young.[103]

Prayer is the recognition of this partnership between man and God in the making of a world. "Our Father, may Thy Kingdom come; may Thy will be done, Thy plans followed, by me and by my brother men." [104] We do not need to secure God's attention or influence His will.[105] Prayer is not to give God information. The Father is so close to us that He knows what things we have need of before we ask Him. He wishes us to ask, because asking is a proof of our interest.[106] To pray for other persons means sharing His attitude toward those persons.[107] The communion with God in prayer is direct and personal.[108] It is the coöperation of two harmonious wills. When our plans coincide with His, there is no limit to the possibilities of prayer. Whatever we ask in Christ's name, that is in his spirit, we shall receive.[109]

5. *Because of the character of the Universe and the solidarity of human society, it pays to be brotherly and filial.*

No man lives to himself alone. Even our daily speech has eternal consequences.[110] The world owes its preserva-

[99] Mk. 6:37-38; Jn. 6:8-9; Lu. 5:4-7.
[100] Mk. 11:25; Matt. 18:15-18; Jn. 20:21-23.
[101] Matt. 5:38-48.
[102] Matt. 19:3-12; Mk. 10:2-12; Matt. 5:27-32, 8.
[103] Matt. 18:7-14.
[104] Matt. 6:9-10.
[105] Matt. 6:7.
[106] Matt. 6:8; 7:7-11; Lu. 18:1-8.
[107] Matt. 5:44-45; Lu. 23:34.
[108] Matt. 6:6; Lu. 18:9-14. Compare Jesus' own prayers, as given in Matt. 11:25-26; Lu. 22:42; 23:34, 46.
[109] Mk. 11:24-25; Jn. 14:13; 15:7.
[110] Matt. 12:33-37.

tion and its light, or the opposite, to our influence.[111] Actions return to us in kind.[112] Mercy and forgiveness are reciprocal.[113] What affects one affects all. Each child of the common Father is taught to pray: Give us this day our daily bread; not, Give me this day my daily bread. Not simply, Forgive me my sins, the debts I have not paid; but, Forgive us our sins, the sins of our common humanity the world over, which weaken and impoverish us all. Lead us not into temptation, but deliver us from evil.[114]

Jesus advocates what might be termed the higher selfishness. The great law of human relations is that you should feel toward your neighbor and his interests as you do toward yourself and your own interests, that you should change places with him, in imagination, and treat him as you would have him treat you.[115] Hatred is damning.[116] We are to love our neighbors as ourselves.[117] And to love one's neighbor is simply to make his welfare a common concern.[118] To find our life we must lose it.[119] The way to receive is not to grasp but to give. Because to give is to secure the goodwill of those around you, and this in turn will lead to practical and substantial expressions of goodwill.[120]

Jesus teaches the folly of revenge. You never will overcome evil, he says, by further evil, blow for blow, injustice for injustice. You only make matters worse. You pile two evils on the back of the community instead of one, take a second angry man out of the ranks of efficiency. To submit to a blow or a personal injustice is

[111] Matt. 5:13-16; Lu. 11:33-36. *Cf.* Matt. 18:7-14.
[112] Matt. 7:1-5; Lu. 6:37-38.
[113] Matt. 5:7; 6:14-15; 18:21-35.
[114] Matt. 6:9-13; Lu. 11:1-4.
[115] Matt. 7:12-14; Lu. 6:31.
[116] Matt. 5:21-22.
[117] Matt. 22:39; Jn. 13:34-35.
[118] Lu. 10:25-37.
[119] Matt. 10:39.
[120] Lu. 6:38. *Cf.* Mk. 9:41; Matt. 6:31-33.

often better than to resist. There is less provocation for further blows; there are fewer wounds to heal.[121] The only final remedy for wrong is to admit our enemy or our rival into the order of goodwill.[122]

The lust for wealth or power or display, for their own sake, is out of place in God's spiritual order. Pride is ridiculous, to any one with a strong sense of humor.[123] Covetousness is tragic.[124] A man's life does not consist in the number of things which he owns.[125] The standard of living may be raised so high that possession becomes a burden. There are higher values, which cannot be stolen or corroded or eaten by moths, and which may be preserved without constant care and worry.[126] Our heart follows our investment.[127] Jesus himself spurns the temptation of easy money.[128] For the sake of freedom, he practices the simple life,[129] and commends it to others.[130] Wealth is full of subtle temptations.[131] What does it profit, to gain the whole world and lose your soul?[132] A divided allegiance is impossible; we cannot serve God and Gold.[133] Money may prove an impossible handicap, to one seeking character, usefulness and happiness.[134] Human rights transcend the rights of property.[135] The workman has a right to his wages,[136] and the business man to a reward for special ability and initiative.[137] Inefficiency is a disgrace.[138] But the sense of service rendered transcends the pay.[139] No labor of man or woman need be mere drudgery.[140] Fidelity should be a by-product of

[121] Lu. 6:29-30; Matt. 5:38-42, 21-26.
[122] Matt. 5:43-48; Lu. 6:27-36.
[123] Matt. 6:2, 16, undoubtedly exaggeration.
[124] Lu. 12:13-21.
[125] Lu. 12:15.
[126] Matt. 6:19-20.
[127] Matt. 6:21.
[128] Matt. 4:8-11.
[129] Matt. 8:20.
[130] Lu. 10:40-42.
[131] Matt. 13:22.
[132] Mk. 8:36-37.
[133] Matt. 6:24.
[134] Mk. 10:17-25; Lu. 14:33.
[135] Lu. 8:26-37.
[136] Lu. 10:7.
[137] Matt. 25:14-23.
[138] Matt. 25:24-30.
[139] Lu. 17:7-10.
[140] Lu. 10:38-42.

every business.[141] All possession involves stewardship.[142] The chief value of money is to make friends, not by corrupting but by enriching the lives of others.[143] Failure to do this makes the rich man pitifully and hopelessly poor.[144] The most rewarding hospitality is shown to those who can make no return.[145]

On the basis of brotherhood, Jesus teaches democracy in human relations.[146] The only aristocracy he recognizes is the aristocracy of service.[147] It is those who are modest, and therefore teachable, who have the key to a Kingdom.[148] The honor that comes to men is in inverse ratio to their pride.[149] Jesus raises woman to a new plane of equality and courtesy.[150] The Kingdom of God is to be world-wide.[151] Race hatred finds no place with a Jew who makes a Samaritan the hero of one of his stories.[152] Caste is equally foreign to his teaching and practice.[153] The most menial task may be made a sacrament.[154] Human brotherhood transcends the bonds of blood.[155] Through sacrifice for humanity, one is initiated into a freemasonry of brotherhood, with its own privileges and compensations. "There is no man who has left house, or brothers, or sisters, or mother, or father, or children, or lands, for the sake of the great cause, but will receive a hundredfold, even now in the present life—houses, and brothers, and sisters, and mothers, and children, and

[141] Lu. 16:10-12.
[142] Lu. 12:47-48.
[143] Lu. 16:1-9. *Cf.* ministry of beauty, Matt. 26:6-13.
[144] Lu. 12:16-21; 16:19-31.
[145] Lu. 14:12-14; Matt. 5:46-47.
[146] Matt. 23:8-11.
[147] Mk. 10:42-45; Lu. 7:28.
[148] Matt. 5:3; 18:1-4.
[149] Matt. 23:12; Mk. 9:35; 10:31; Lu. 14:7-11.
[150] Jn. 4:27; 19:26-27; Lu. 10:38-42.
[151] Lu. 13:29; Matt. 28:19; Jn. 12:32.
[152] Lu. 10:33. *Cf.* Jn. 4:9; Matt. 8:5-13.
[153] Matt. 9:10-11; Lu. 19:5-7; 14:12-14.
[154] Jn. 13:1-15.
[155] Mk. 3:31-35. *Cf.* Matt. 10:37.

lands." [156] "Happy are the gentle-men, for they will inherit the earth." [157] That is, God's world eventually will come into possession, not of the bully but of the courteous man, who, with all his ability to see opportunities and his shrewdness in grasping them,[158] is considerate of others' rights and interested in others' welfare. The unsocial man is excluded from God's family as abnormal; in fact he excludes himself.[159] The same doom is pronounced on the unsocial nation.[160] Service is the inexorable test, which spells destruction to those who fail to meet it.[161]

Here is a theory of human relations that is simple, comprehensive, self-consistent, and eminently practical. Has Jesus given a correct solution of the riddle of the Universe? Does his interpretation square with the world as we know? Will the theory work? That is the question before us. I propose to use Christianity as a working hypothesis.

[156] Mk. 10:28-30. *Cf.* Rom. 16:13, "his mother and mine."
[157] Matt. 5:5.
[158] Matt. 25:14-30; Lu. 19:12-26.
[159] Matt. 22:11-13; 18:17; 25:30, 46.
[160] Matt. 21:33-43; Lu. 13:29-30.
[161] Lu. 20:9-18; Matt. 7:24-27.

PART I

THE EXTERNAL UNIVERSE

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II.

THE PASSING OF PHYSICAL MATERIALISM.

Jesus' spiritualistic philosophy meets its first test as it faces the problem of the external world. Modern Astronomy has immensely expanded the physical Universe in which man's life is spent. Our great solar system, with its planets in orderly rotation and revolution, is but the vestibule. A billion other suns are distributed through a space so vast that we reckon distance not by miles but by light years. The light from the more distant stars requires more than 200,000 years to reach us. Telescope and spectroscope reveal the cyclic changes through which these stars are passing, and have been passing for we know not how many million years.

Of this newly discovered world of Astronomy, I shall speak more at length in a later chapter. Suffice it to note here that the physical Universe is one inter-related whole. Suns and satellites, clusters and spirals, nebulæ and star dust, are embraced in a single system. Everywhere we find the same forces of gravity and radiation pressure. The rays of heat shot out from one unit, in time reach and act upon the other units. The same chemical elements found on our earth have been detected in the stars. Solids and gases everywhere follow the same laws of behavior.

What is the nature of this physical Universe, this vast Mechanism with which man is so closely connected? Jesus

claimed that it is spiritual, dynamic, the vesture and manifestation of the living and ever present God. Opposed to this is the philosophy of Materialism, which grew up out of the advance in physical Science. Matter itself is the ultimate reality. The Universe is merely an infinite congeries of atoms, unchanging in quantity, constantly entering on new arrangements within a semi-material Space or Æther, under stress of an Energy which is redistributed but never altered.

As thus stated, the two theories are mutually contradictory. But it is possible to bring them onto a common plane. A pure atomism is not held today by any leading scientific thinker. The uniformity of Nature, the causal nexus between all phenomena, the laws of conservation—have compelled us to regard the world as a unity. Jesus likewise thinks of the world as a whole. Throughout it reveals the activity and expresses the character of God. Thus Christianity and Science speak of the same "Universe," although in different terms. The question at issue is this: is Matter material, or is it essentially active, or dynamic?

Except for the strain on the imagination, the philosophical problem before us is not affected by the great extension in space and time. The study which will give us the nature of Matter must be intensive. To understand the ultimate structure of a grain of sand or a cubic inch of air, the forces at work and their interaction, is to know the physical Universe in its totality.

The most important event in recent Thought is the passing of Materialism, as a philosophy based on scientific induction. The age-long problem of Matter has been attacked, and in a measure solved. Modern Physics has taken a position which is entirely consistent with Jesus' theory of a spiritual Universe.[1]

[1] A more detailed study of the new Physics will be found in my *Unfolding Universe*, 1915, chaps. 3 to 5. The best introduction for the general reader is R. A. Millikan, *The Electron*, 1917, with full

Materialism was done to death, not by the cloistered student, spinning a web of idealism from his own brain; not by the militant theologian, turning his blind eye to the facts of Science, that he might fight on ignorant and undaunted. The materialistic doctrine, so often put forth in the name of Science, was destroyed through the further study of the scientists themselves.

Sir William Crookes began it, in 1870. He had been studying the new cathode rays, formed by passing electricity through a vacuum tube. He made the discovery that the rays consist of minute particles, carrying a negative electric charge. Twenty years later these particles, or electrons, were studied more closely by Professor J. J. Thomson of Cambridge, and others. A series of experiments, as brilliant as any in the history of Science, yielded the discoveries which are revolutionizing both Physics and Philosophy. We learned that electrons are the units of the electric current. All flow of electricity, from the flash of lightning to the power generated by turbines and passed through the filament of our electric lamp, is a stream of these tiny particles. We learned further that the solid atom, hitherto the unit of Matter, is composed of electrons, and of particles bearing an equivalent positive charge. The units of Electricity are the units of matter: the basis of the air we breathe, of the floor we walk on, of our flesh and bone and blood and brain.

Just before the close of the century came the discovery of radium, and of other radioactive substances. Here a

references. See also J. S. Ames, *Constitution of Matter*, 1913; Comstock and Troland, *Nature of Matter and Electricity*, 1919; Norman R. Campbell, *Modern Electrical Theory*, 2nd ed., 1913; H. A. Lorentz, *Theory of Electrons*, 1909; O. W. Richardson, *Electron Theory of Matter*, 1914. For the earlier Relativity theory, R. C. Tolman, *Theory of the Relativ. of Motion*, 1917. For the generalized theory, the excellent popular summary by Albert Einstein himself, Eng. trans. by R. W. Lawson, 1920; J. Malcolm Bird, etc., *Einstein's Theories of Relativ. and Gravitation*, Scientific American, 1921; and A. S. Eddington, *Relativ. Theory of Gravitation*, London Physical Society, 1918. (I prefer this to his *Space, Time and Gravitation*, 1920.)

complex atom is in process of breaking down. As it does so, it shoots forth electrons at enormous velocities. Kaufmann and Bücherer gave Materialism its mortal wound when they proved that the swiftly moving electron has a larger mass than the electron which is moving with comparative slowness, as in the cathode ray. That is, part of its mass is not material at all. The inertia of the electron, the apparent solidity of this minute physical body which lies at the basis of all physical bodies, is largely due to its motion, or to the opposing forces set up by its motion.

Later researches have indicated that all the mass of the electron is electrical in origin. Physicists find that the connection between mass and velocity is what would be expected, if the entire mass is due to the electric charge. To lose its energy would be to lose its mass. The electron is not a solid particle, as was at first supposed, but a point or region where a definite electric charge is concentrated. The same is probably true of the corresponding unit of positive electricity, very much larger in size, but by no means as well known. To consider the positive units as other than electrical, is to introduce what Lorentz calls an unnecessary dualism. The working hypothesis of present-day Physics is that "matter is of an electrical nature, and the forces of cohesion between the particles, which give a solid its rigidity, are electrical forces." [2] As another writer puts it, all the properties of matter may be explained as the "statistical result of the behavior of the individual electrons." [3] Much work remains to be done in tracing these relations and behavior. The absorbing problem of theoretical Physics is that of the arrangement of electrons within the atom, and its connection with the radiation of light. But the entire viewpoint has changed. The physical world is not composed, as we used to think, of solid atoms, little pellets of stuff, moving about in groups in an elastic medium known as the Æther. It

[2] A. S. Eddington, *Nature*, 101, p. 15, 1918.
[3] R. C. Tolman, *Relativity of Motion*, 1917, 15.

is now thought of as made up of centers of electric force, positive and negative, acting upon each other, and keeping one another in incessant motion.

To one accustomed to thinking in terms of an atomic theory, the electrical view of Matter comes as a relief and not as a burden. The dead stuff of a purely physical universe, however Idealism might seek to ignore it, was something of which neither Idealism nor Materialism could give a satisfactory explanation. It remained an irreducible surd in any equation of reality. The New Physics gives us a dynamic Universe. Electron units are active and not merely passive. If any one doubts whether they are active, let him touch a wire along which a stream of them is passing. And a Universe made up of such "live" units is, to some degree at least, self-sufficient and self-explanatory.

Then came the doctrine of Relativity to give Materialism the stroke of mercy. We must give up even the idea of a fixed medium for physical units. There is good reason for believing that the earth is moving around the sun at a rate of about 20 miles a second. Repeated attempts have been made to detect this motion, with reference to a surrounding Æther, but absolutely without result. Einstein therefore rejected the idea of any fixed frame of reference. The only motion which can be detected is motion of one body relative to another. No such thing as absolute motion is known to us. If an observer and the body whose velocity he is trying to measure are moving uniformly, each has its own space and time. There is no way of directly comparing one system of space and time with another. All we can do is to make a mathematical transformation of two sets of space-time coördinates. If there are some of my readers who have not even a bowing acquaintance with coördinates, I would state that they are the imaginary linesmen stationed along the field to mark the position of the ball on successive downs. Where we have two balls, we must have two sets of lines-

men. By the use of this system it is possible for the mathematical sportsman to follow the games which are being played all over the country. The laws of Nature, which are given us by our study of Mechanics and Dynamics, may be stated independently of the observer's particular scheme of space and time.

Recently Einstein has generalized his principle to cover all types of motion. The deflection caused by a field of force, for example gravitation, means the introduction of a new space and time for the deflected body. The deflection is represented by another series of space-time coördinates, similar to that introduced for uniform motion. We follow the game, as before, through the reports of imaginary linesmen, and it appears to be played in the same way. A man falling from a roof would, during his descent, be constructing a new series of space-times, and might not know he had been falling, except for the forces of cohesion in the material which stopped his motion. Einstein's principle was suggested by a case of this sort which came under his observation.

The new theory was able to explain the puzzling discrepancy in the advance of Mercury's orbit. A second crucial test was the prediction that the light from the stars, when passing near the sun, would receive a certain amount of deflection through the sun's gravitational attraction. This was brilliantly confirmed by the eclipse expeditions of 1919.

Momentous consequences follow from this doctrine of Relativity. That bulwark of Thought, the Newtonian Mechanics, with its assumptions of a fixed and unvarying space, time, mass, etc., is being thrown overboard piece by piece. Mass is equivalent to energy, and increases with velocity. "Space and time in themselves," as Minkowski said, "vanish to shadows, and only a kind of union of the two preserves an independent existence." The Æther itself, the hypothetical medium for the action of forces, is discarded as being merely a scientific fiction, which cre-

ates more difficulties than it explains. Or else we relegate it to be the mythical abode of Lodge's disembodied spirits. We are no longer troubled about action across empty space, because we have ceased to talk about a space "in which" things move.

As a picture of reality, the Geometry of Euclid must go the way of the Newtonian Mechanics. Even while you are representing your objects as cubes and polyhedrons and spheres, the electrons which compose the world have taken a thousand other arrangements. There is no medium to retain the form of any of them. We are obliged to construct space by means of moving points and lines, instead of cutting up a space already made. As Sommerville puts it, space and matter are inextricably entangled. It is necessary to "build up a monistic theory of the physical world in terms of a single set of entities, material points, conceived as altering their relations with time." [4]

Trained as we have been in the old way of thinking, it is not easy to adjust our thought to a physical universe, whose component parts are constantly changing their relations, and with no material substratum whatever. Our minds grow dizzy. We long for the old world of reality, which appeared to stand still whenever we wanted to observe it. But an adjustment to the "moving continuity" of the new conception is by no means impossible. Our thought soon grows accustomed to the unceasing movement. We come to regard reality as a flow, however it may be necessary for the intellect, as Bergson says, to arrest this flow, and represent it as a series of fixed states, like the separate pictures of a cinematograph film.

When the modern Rip van Winkle, after a long sleep, returns to the study of Physics, he finds himself in a new world. That world is no longer "material." Pellets of stuff, æther medium, fluid space, alike have vanished. The fundamental fact is these electric charges, with their

[4] D. M. Y. Sommerville, *Elements of Non-Euclidean Geom.*, 1914, 201.

properties, their motions, their interactions, their relations and sequences. A mechanical arrangement of passive units has given place to a dynamic Universe. Matter has not disappeared; it cannot be ignored. But it is being stated in terms of Force or Energy.[5]

This revolution of thought tends to close the gap between Physics and Biology. The organic loses its exceptional character. The appearance of life on this planet ceases to demand a special creative fiat. More and more the phenomena of Life are being stated in terms of chemistry. We are able to modify organic processes by changing the surrounding medium. Biologists confidently expect to produce in the laboratory some of the syntheses of physical particles on which the life of the cell depends. What does all this mean? That Materialism has won the day? Some such fear has haunted many a Christian man in our generation. But physical particles themselves are no longer "material." They are centers of electrical concentration, parts of that unity of interacting centers which we know as the Universe. The mechanist, working forward from the new arrangement of atoms which is characteristic of the organism, and the vitalist, working backward from the behavior of living creatures, find a possible meeting ground in this conception of a world of forces and force-centers, which forms the common basis of Matter and Life. It is not difficult to conceive of an electrical atom and a living cell as belonging to the same family. A new grouping of forces may be expected to show new properties, as, to quote an analogy from T. H. Morgan, the properties of sugar differ entirely from the sum of the properties of carbon, hydrogen and oxygen.

[5] What Force is in itself, as represented by the deflections associated with an electric charge, is still a matter of debate in the scientific world. To Eddington, for example, both matter and energy are the expression of world curvature. They are part of our perception that such curvature exists. (*Space, Time and Gravitation*, 1920, 92.) Rather than enter on this doubtful region of metaphysics, I prefer to leave "force" and "dynamic universe" as undefined terms given us by our observation of the world.

The same is true of that higher, more specialized form of life which we call Mind. The human mind uses an elaborate machinery of brain and nerve cells, which itself has helped to organize, and on which its activities depend to a large degree. Mental states are closely correlated with cerebral states. Damage to the brain affects the mind. The destruction of certain centers in the left brain of a right-handed person, means the loss of word-hearing, or of word-seeing, or of word-speaking. But this does not mean that the mind is material, or dependent on what is material. There is no longer any such thing as the material, in the old sense. The phenomena all come within the field of energetics. The Universe appears to us not only in the comparatively simple groupings of electrons which we find in inorganic chemistry, but in the elaborate molecules which go to make up living cells. These cells in turn, when grouped as organisms, and specialized in brain and nerve cells, reveal properties and powers in the Universe, of which the student of the inorganic world knows nothing. Of necessity the physiologist will emphasize the processes of the brain. The psychologist concentrates his attention on its properties. But the electron and the albumin molecule, the living cell and the human mind, the neurones of the cerebral hemispheres and the scientist who directs or inhibits them, all find their place in a dynamic Universe.

Still another gulf has been bridged, between Science and Religion. A physical Universe of this character, linked as it is with organisms and brain cells, fits into the Christian interpretation of the world. The idea of God will need to be reformulated. But recent Physics and Jesus' conception of God's activity in Nature constitute a mutual approach. They meet in a new and comprehensive unity, which calls for another chapter.

III.

GOD RESTATED.

The passing of physical materialism breaks the spell of Divine aloofness which Augustine and Aquinas laid upon Christian thought. The Middle Ages passed on to modern Europe a dualism quite similar to that of the Pharisees —God and His creation, Heaven and Earth, Spirit and Matter. Of the two parts of this inheritance, it was the material world which Europe was beginning to study by the new inductive method. One discovery followed another. Growing knowledge brought an increasing mastery of the world. Surplus human energies were engrossed by scientific research, by manufacturing and trade. Religion suffered in consequence. With the decay of religious faith during the 18th and early 19th centuries, there came into vogue the materialistic philosophy of the Universe to which I referred in the last chapter. The spiritual realm appeared so remote that men readily listened to the suggestion that it was unreal. The effect was far reaching. Two of the most powerful influences of modern times took shape in this era. Science developed a materialistic tradition, which was intensified by its conflict with current Theology. Socialism was given its classic expression by leaders who were under the spell of the same anti-clerical and materialistic movement.[1]

Jesus' idea of God's direct and universal activity had been practically forgotten. As long as men conceived of

[1] See Andrew D. White, *Hist. of the Warfare of Science with Theology*, 1903; W. Rauschenbusch, *Christianizing the Social Order*, 1912, 110. However idealistic the modern Socialist may be, he is likely to be a materialist in the type of his thought.

the world as material, it was necessary to distinguish sharply between God and the world. The two could not be considered akin. The relation in which they stood was that of Creator and creation. And here Christian thinking faced a dilemma. Either God made Matter out of nothing, a feat which it was almost impossible for the human mind to grasp. Or Matter had always existed, a position that appeared to limit God. The Hebrew tradition, as embodied in the first chapter of Genesis, seems to imply some permanent raw material which God worked up in the course of creation. A third alternative was to make Matter an idea or an illusion, which the practical Western mind could not accept.

Scientific philosophy, as we have seen, concentrated its attention on Matter, ignoring or denying a Creator. Religion, on what were for the most part valid grounds, continued to develop its doctrine of God. The result was a Tower of Babel. These two branches of human thought came to speak different languages. Neither could understand what the other was trying to describe. The Christian charged the scientific man with denying God. The latter regarded the Christian as an obscurantist, on whom the accumulated knowledge of Science made no impression.

The effect of this dualism on Religion was equally unfortunate. The material world, with which men have so much to do, was constantly encroaching on the Divine. Every youthful religion has thought of its god as present and active in the world. As the religion grows older, the divinity becomes less immanent and more transcendent. The god who once took a hand in all the affairs of Nature and of the community life, now intervenes only in special crises. Once God's activity in the world was direct and personal; now he works only through second causes or through angels. Once he lived in the tree and the spring; he walked in the garden in the cool of the day. Now he dwells in a distant heaven, august, inaccessible. Once he was the intimate of man, his friend and ally, his guest at

the sacrificial feast. Now he sits on his throne, surrounded by courtiers and menials, receiving as of right the flattery and adoration of his earthly subjects.

To the average worshipper, at the beginning of the 20th century, the world was real but God was unreal. God's world had pushed God so far away that He appeared to have little to do with our everyday life. No figure is more pathetic than that of the sincere Christian of the dualist school, opening his daily newspaper with the lurking fear that God has been disproved.

The situation was indeed alarming. Students of Society are beginning to recognize the importance of Religion as a factor in human development. I can only indicate, in the briefest way, its biological significance. In the earliest cultural stages known to us, we find men seeking to know and adapt themselves to their Environment. And this adjustment is largely mental. It takes place in the region of ideas, emotions, values, attitudes. The savage tries to escape from the evil powers which he conceives to be back of the objects and activities of the world around him, and to bind to himself the powers he thinks of as beneficent. Crude as the process seems to us, it was biologically sound and of very great practical utility. We owe to it the beginnings of agriculture, animal husbandry and the arts. Human life took on dignity and meaning. Adolescence and reproduction assumed a mystical importance. Religious sanctions were the foundation of morality, and made possible the solidarity of the clan or tribe. However much the ideas and forms of Religion have changed in the course of centuries, religious faith retains its essential character. Men still seek to adjust themselves to the Universe, by value-judgments and the establishing of personal contacts. We have noted the tendency in the modern era to separate science and the arts from their original dependence on religion. The verdict of History is that this separation cannot safely be carried beyond a certain point. As we face the ac-

tivities of the external world, and whatever lies behind them, the attitude of confidence and coöperation has a survival value for the individual or for the social group. Without it, human associations are in the long run unworkable. Religious decadence and general scepticism are a mark of social decay. They might be termed a biological retrogression. Man is less fitted to work with his Environment.

The new position taken by physical Science opens the way for a realinement of Christian doctrine. If Matter is dynamic rather than material, it is no longer necessary to say that God is outside of the world which He has made. Such a distinction has lost its value. The world may better be described as the unfolding of God's activity. Creation must be stated in terms of evolution rather than of manufacture. God, instead of being a supreme and perhaps unknowable epiphenomenon, a fifth wheel to the world's onrushing car, becomes known to us in and through our Environment. The way is open for us to recover Jesus' sense of a dynamic, a spiritual world. There is no other. Not Matter but Energy is at the basis of the Universe. It is the materialist's world of inert stuff, of dead atoms, of fluid space, which proves to be unreal. When the physicist studies the Universe, he is studying God, in certain modes of His action. God Himself, and not one of His creatures or emanations. The theologian is talking about the same great fact. He is trying to describe a spiritual Universe. By the use of other lines of evidence, other contacts and judgments of value, the Christian interprets God as the Divine Parent, whose spiritual order is revealed to our experience through Jesus Christ. Science tells us the way God does His work. Christianity explains the character of the Universe and enables us to make our adjustment more intelligent and fruitful.

Science and Religion are thus two sides of the same process of mental adaptation. Each is supreme in its own

field. The function of Science is to describe; the function of Religion is to interpret. The scientist must be absolutely free to study the facts of the Universe and report his findings. No one else is competent to do so. In its own sphere, Religion must be given the same right of way. For the scientific worker to say that there is no God back of the phenomena of the Universe, would be as presumptuous as for the theologian to deny the atomic theory or the fact of organic evolution. Science may describe the facts of the world, but it cannot interpret the world as a whole. I speak positively on this matter, because for many years I was engaged in what I believe was an honest and competent attempt to interpret the world on the basis of scientific induction. I found that after a certain stage in the enquiry I reached the end of my rope. Induction failed because the data were incomplete. By no conceivable perfecting of scientific method can the situation be remedied. In order to make further advance I was obliged to turn to religion in general, and in particular to the climax of religious development which we reach in the experience of Jesus. He interprets the Universe as expressing the activity of a moral and altruistic God. Our concern is with the value of this idea, rather than with any particular theories as to its source. Philosophically it must be counted as a hypothesis, but no other hypothesis is at hand. Either Jesus has given a correct interpretation of the Universe, a problem to which the present book is devoted. Or no interpretation is possible; the Universe is a Chaos, without intelligible meaning. To return to my original point, the distinction between the scientific and the religious attitude and method is merely for practical convenience. Normally the same mind will hold both attitudes and follow both methods. It is only by combining the two that we gain a complete picture of the Universe.

The mystic sees God, where other people see only soil and flesh and implements and wood and steel. The differ-

ence is partly in temperament, partly in the power of imagination, partly in training and intellectual environment. But God is there, in all the physical world, whatever names we give to it. The most matter of fact person is as truly in contact with Him as is the religious mystic or the dreaming poet, of whom our next chapter will have much to tell. Once let the practical man catch that point of view, the point of view of Jesus, and a righteous and loving God begins to be for him a supreme reality, and no longer merely a name or a tradition.

The revolution of thought which I have sketched may mean the beginning of a new Christian era. Faith and worship become once more an integral part of life. The religion of Christ, with which our modern civilization is identified, should have in the future a note of reality, a this-worldliness, a practical mysticism, which it has not known since Jesus taught in Palestine. Can God seem distant or unreal when the very food we eat, the clothes we wear, the body that is clothed and fed, are essentially Divine? The physical, as Dearmer says, becomes a sacrament, the outward and visible sign of a spiritual Presence. Each day is sacred that is lived with Him. Each spot is holy where we meet our God. All functioning of body and brain becomes an act of communion. The natural world takes on new beauty and meaning. Every human activity finds a place in the spiritual order which God and men are making a reality on earth.

Yesterday God to the average man was an abstraction. Christian theologians, not yet emancipated from Greek and German philosophy, tended to treat Him as an idea, an Absolute, a bundle of ideal qualities which it was often difficult to translate into the concrete.

Today, if we accept Jesus' spiritual interpretation of the world, God is a fact, the great fact of existence, the one thing real in the external world from which there is no escape. In His constant and ordered activity we live and move and have our being. Religion is no longer a

matter of choice. In the broad sense, every man is religious. The atheist and the Christian, the artisan and the astronomer, the physicist and the priest, alike are in contact with that ever-present, unavoidable Universe, which the Christian, through his deeper experience, has learned to call the presence of the Father. I do not attempt to state the exact relations between God and the physical Environment. But the two are so close, in our experience, that to ask proof of the existence of God would be to prove the existence of the Universe, which only an occasional bedouin philosopher considers necessary.

It is evident that our idea of communion between man and God must be given a broader meaning. Intercourse with a Deity who lives up in the sky, is one thing. Intercourse with a God who fills all the world that our senses reveal to us, is quite another thing. In the next chapter, let us consider man's communion with God in Nature.

IV.

MAN'S COMMUNION WITH NATURE.

Jesus' sense of God's activity in Nature was buried for many centuries. Christian thought was pitched in another key. Its joy was found in anticipations of a future heaven, rather than in appreciation of the present earth. The world was essentially evil; the Day of Judgment was at hand. Christians, writhing under persecution, found comfort in the Jewish imagery of the last things. Then apocalypse gave place to asceticism. The ideal Christian life, possible only for the few, was to withdraw from the world and its pleasures, and mortify the flesh for the sake of the soul. In the break-up of civilization during the following centuries, men had no spirit for the enjoyment of Nature. Augustine's dream is of a city, and that not of this earth. The Greek love and worship of beauty dies out; the passion for country life, the delight in landscape for its own sake, which we see in Horace and Vergil. Almost the last echoes of nature-love are found in some charming bits in the *Elocutio Novella,* and in the description of the Moselle by the Christian teacher Ausonius, toward the end of the fourth century. Teutonic thought was cast in a gloomier mold. Land clearing meant a hard and unceasing struggle with natural forces. The forest, which fills such a large place in mediæval folk-lore, was peopled not by nymphs but by pixies and goblins. Wild nature was not loving but terrible.

The recovery of Nature was not due to the churchmen, whose thoughts were elsewhere, but to the poets. Wandering students trill very pagan songs. At the end of the

12th century, Walther von der Vogelweide sings in castle courts of "the flowers pressing out of the grass, early on a May morning, and smiling at the playful sun." A hundred years later, Dante has the gift and the leisure of mind to observe the natural world and enjoy it and describe it. Dafydd in Wales paints his lyric pictures of the birds. Petrarch finds in his mountain retreat at Vaucluse, and in his study of antiquity, something of that world of natural beauty which men once knew and were to know again. Chaucer says farewell to his books and his prayers, when Spring comes and he hears the birds singing.

The Renaissance revived the feeling of the Greek and Latin writers toward the natural world, which once more became something it was legitimate to study and enjoy. The movement represented a new energy and broadening sympathies. But it tended, like any revival of the old, toward artificiality. The love of Nature was an affair of fountains and trim garden walks, of classical imagery and courtly sentiment. Only in England did it become freshly creative. The lyrics of the Elizabethans are spontaneous, overflowing, sometimes even boisterous in their enjoyment. The landscape backgrounds of Shakespeare, the more elaborate descriptions of Milton, are equal to the best in classic literature, and with a human feeling which is their own. In England too a cold and symmetrical mannerism succeeded, for nearly two centuries. But the love of country life, once gained, was never lost, as Palgrave has shown in his quotations from minor poets.[1]

In their treatment of Nature, the painters fared in some ways better than the poets. Theirs was a new art, and not a revival. No classic models survived to hamper freedom of expression. Popular taste continued to demand conventional figure painting, even in the treatment of natural scenery. But long before the rise of Romanticism, Titian and Dürer had begun to turn space backgrounds into true

[1] F. T. Palgrave, *Landscape in Poetry*, 167 *ff.*

landscape. Salvator Rosa caught the appeal of the romantic and sublime. Claude studied Nature so closely that he was able to generalize its impressions of atmosphere and sunlight. And generations of gifted Hollanders, in their rendering of ocean, sky and land, whether with bold naturalism or the poetic interpretation of wide spaces, developed a knowledge and appreciation of natural beauty which in a later age would find ample recognition.

It is not until Rousseau that Europe really comes to love wild Nature. Men break away from the artificial and conventional. The romantic spirit invests every natural object with charm and human meaning. This feeling has become so instinctive with us moderns, that it is hard to think our way back to the days, only a century and a half ago, when men did not pass through the Alps except from necessity, when a geometrical garden was preferred to a wooded hillside, and to go from city to country was apt to be considered a form of exile or penance.

God's natural world is a Temple with various courts. To enter the outer precincts, one need not name the name of God. No set forms of worship are prescribed, no offering, no temple fee. An artist's eyes are good. But the only requisites are a mind at leisure and a receptive soul. Let a man put aside for a while his work and cares, and step into the freshness and beauty out of doors. At once he finds himself on holy ground. The pure air fills his lungs, tense nerves relax, a new peace steals upon his spirit. His senses are alert to the beauty and melody around him.

The comfortable warmth of the sun in the early springtime, and the smell of moist earth. The brownish green of the prairie grass, with a background of red stems in the windbreak of willows. The first shy anemones, and the glory of marsh marigolds by the brookside. Wild plums and cherries with their splashes of white, set off against

that new green world which the gooseberries had been foretelling. A whiff of wild-grape blossoms. The apple trees in their bridal beauty.

The aromatic fragrance of the sweet-fern, basking in the summer sun. The mountain stream where trout are hiding, and one takes toll besides of every mossy rock and silver brown ripple, of the sunlight through translucent young birches, and the cool damp shadows. Strawberries hanging over the brook at the edge of the meadow, where the queenly elm keeps solitary state. The lake at evening, as you glide out with your canoe and witness the marriage of sky and shore.

The first sharp frost of Autumn, decking sumac and swamp maple in brave scarlet coats. Poplars minting their golden coins. The riotous colors of the sugar-bush in northern New England. The Turkish tapestry of the Connecticut hills.

Bare branches, dividing the sky into traceries of forgotten beauty. The sparkle of fresh snow, and the ozone in one's lungs. And Spring will begin a new cycle of rhythmic loveliness. "How good is man's life, the mere living." If appreciation of God's world be worship, every red-blooded devotee is the better for communion.

But nature worship is an instinct, universal, irrepressible. If we may not visit mountains and woods and streams, we can hang on our wall the interpretation which some artist has given of them, or the camera's reminders. No home so poor but it may set up an altar in the shape of a potted plant, a slip to which the housewife brings her daily offering of water and love, a bulb that shows to wondering young eyes the miracle of resurrection. No slum but has its flower vender, who finds eager purchasers. To my thinking a single rose, bought with one's last coin, is lovelier far than a plutocratic sheaf of blossoms. Even when the flower fades, the leaves and angled stem live on as objects of exquisite beauty. Every civilized city must have its parks, for the great multitude who cannot go

afield. We feel it a sacred duty to God and to humanity to reproduce as best we may the trees and flowers of His natural world, and the green grass where tired eyes may rest and children play.

From this outer precinct of the Temple, some of us pass in to the court of Imagination. I confess that I seldom enter this sacred area, except when some poet or painter leads me. It is not that my powers of imagining are deficient. It is not that I see the machinery of natural processes, for of these I know comparatively little. But my senses are so keen, my enjoyment of form and color so satisfying, I am so engrossed by Nature's unspoken friendliness, that I am not apt at drawing lessons or tracing spiritual meanings. I never should have made a good Greek, to people the natural world with nymphs and goddesses. I do not find in it suggestions for an old age vision of death, like the youthful Bryant. And yet I enjoy it when my friends make Nature a setting for things human.

A favorite painting by Sontag represents a wild forest scene. In the foreground is a log cabin, with the blue smoke curling upward. Now when I go to worship out of doors, unless I have some creature needs which man alone can supply, I prefer to take my forest straight. I object to intruders, to vulgar tourists, to farmers slashing into my favorite woods. But I am glad the painter put in the log cabin. Under the spell of his art, I can enter again into the hardships and satisfactions of the homesteader's life, as he hews a farm of his own out of the timber. In a certain picture of the Maine coast, the last rays of the sun touch the top of the cliffs, the masses of cloud, the distant island, the hollows of the ocean swell. But it is good that the artist adds some ships, to catch the golden light on their sails. And the two women on the rocks, in the costume of 1850, give a touch of fellowship to our common worship. The *Angelus,* without the tired reverent figures and the distant church tower, would

be merely a study of the sunset afterglow in chrome yellow. By putting man into his landscape, the artist helps us to feel that God's world of Nature, like the Sabbath, was made for man.

But there is a Divine symbolism in the outward world which even the most sense-bound of nature worshippers may share, when a Jesus or some other poet-teacher leads the way. To pick a lily, and think that it is God who clothed it in its glorious colors. To ride along a forest road in October and feel that He has passed by, touching the foliage lightly with His frost brush.

All over upland and lowland
The charm of the golden rod,—
Some of us call it Autumn
And others call it God.

Or take the sunrise, as pictured in various ages. For the singer of the Rig Veda, "she comes like a fair young maiden, awakening all to labor, with a hundred chariots comes she," or driving before her the red cattle of the clouds. In Homer too she is the rosy-fingered goddess, rising from her ocean couch, and yoking to her car the swift horses that carry light to men. With the Hebrew psalmist, Jehovah has pitched a tent of many colors for the sun, which is like a bridegroom coming out of his chamber, and rejoices as an athlete to run his race. Or Jehovah covereth Himself with light as with a garment; He maketh the clouds His chariot, and walketh upon the wings of the wind. In Christian poetry, when freed from the trammels of classical convention, the symbolism changes:

Out of the scabbard of the night,
By God's hand drawn,
Flashes the shining sword of light,
And lo! the Dawn.

The inner court, the Holy of Holies, ushers us into the Presence. It is entered, at rare intervals, by the high priests of humanity, who see the natural world with the eyes of a mystic. There come moments in the life of man when "this earth he walks on seems not earth." And the vision melts into the glow of rapturous assurance. The literature of Mysticism shows us how religious men, in all ages, have found communion with Nature a communion with God.

The God we find in Nature will be the God we have already come to know through instruction and social worship. But the Presence is there, for the seer, no matter how unorthodox, to discover and possess. Berenson has called attention to the mystical value of space-composition in the Umbrian school of painters, notably Perugino. His art, while we are under its spell, "woos us away from our tight, painfully limited selves, dissolves us into the space presented, until at last we seem to become its permeating, indwelling spirit." [2]

Perugino but reproduces the elemental rapture which Nature brings at times, especially in far perspectives. A feeling of awful yet thrilling immensity, a quickened pulse and breathing, the sense of being in the very presence of God Himself. In various situations it comes to me. Not only in a building with lofty arches, a cathedral, or one of our really great railway stations. But under the stars on a clear night. Or on stepping forth of a morning beneath the measureless sky of the West, where the blue stretches haze-less to the horizon. I have the same sensation when I come out upon a mountain crest, and look off on wave after wave of giant peaks.

This overwhelming sense of the Divine in Nature comes to many through the medium of wide spaces. Some few, like Whitman, are able to gain from any natural object the same inward identification with the Universe. Even as a child, he tells us, he became the things he looked on,

[2] B. Berenson, *Central Italian Painters*, 1897, 102.

and these objects became part of him, whether they were early lilacs, or "the sow's pink-faint litter," or water plants waving their graceful flat heads at the bottom of the pond. The French writer Sénancourt tells of walking the streets of Paris on a dark day in early March. He was gloomy, and walked because he had nothing to do. He passed a jonquil in full bloom, bearing the first perfume of the year. In that instant, his cup of happiness overflowed. Unutterable harmony, the sense of being in touch with the ideal world, arose in him complete.

Whether in the rapt contemplation of the mystic, or the frank enjoyment of natural forms and colors, communion with the external world is, from our biological standpoint, a most important side of human experience. Love of Nature is a comparatively modern mood. But behind it lie the wonder and awe which have played such a large part in the history of Religion. In his emotional life, as well as in thinking and practical affairs, we find man seeking to adjust himself to his Environment. The Universe, which the religious man calls the manifestation of God, is here. Whatever names we may give to it, we cannot escape from its contact. In the words of the Hebrew psalmist: "Whither shall I go from Thy Spirit? Or whither shall I flee from Thy presence? If I mount up into the sky, Thou art there. If I lie down in the underworld, behold Thou art there. The darkness and the light are both alike to Thee."

V.

THE EARTH AND THE UNIVERSE.

We turn from the murmuring brooks and sunset colors of this pleasant earth, divinely fair, to consider again the stellar universe, and the problem which it forces upon our minds. Jesus' ideas of astronomy were those of his own time. The sky was God's throne, and the earth His footstool. The Master's theory of the world was geocentric; there is no reason to suppose that the notion of other possible worlds ever entered his thought. This earth and the life of man upon it were the center of God's interest. Here the spiritual order was to be developed. God's Kingdom was to come, His will to be done, on earth as in heaven.

It is at this point that the Christian hypothesis meets its second test. Can it be made to fit the Universe of our growing knowledge? When Copernicus in 1543 established the fact that the earth is one of the planets revolving about the sun, and that the sun is a component part of the vast system of fixed stars, it came as a distinct shock to religious thought. The earth seemed to dwindle in this larger perspective, and human life to lose its unique significance.

What are the general features of this physical Universe in which our lives are spent? Nothing is final in Astronomy. Cosmic philosophies, built up with great learning and enthusiasm, have been left behind as mere landmarks in the progress of Thought. Theory has ebbed and flowed, as new evidence pointed this way or that. Dr. See published one view of stellar evolution in 1896, and quite another view in 1910. The same tidal approximation

toward the truth may be expected in the coming days. In this year of our Lord 1921, the general picture given by astronomers is something like this. I introduce the corrections which seem to be called for by Shapley's study of globular clusters.[1]

Our home is in the Milky Way. And the Galaxy, which forms a sort of celestial metropolis, is not laid out as a band around the sky, but as a disk, filled with stars and gaseous clouds. Its outer diameter is estimated by Shapley at 300,000 light years. To locate our solar system more exactly, it lies roughly in the plane of the disk, but decidedly off from the center. According to the latest census, the galactic metropolis contains approximately a billion stars, counting only those which are illuminated. They are separated from each other by an average distance of about 13 light years, or a little over 76 trillion miles. The apparent concentration of small stars in a belt across the heavens, is explained by their distance; we are looking through a greater depth, that is through the plane of the disk.

Eddington has shown that the bright stars are fairly uniform in mass, in spite of exceptional giants, like the newly famous Betelgeuse. They appear to be passing through an ascending and descending series, the color varying as the temperature rises or falls. The action of gravitation, what-

[1] A fuller treatment will be found in Appendix B. *Recent Progress in Cosmogony.* Any attempt today at an astronomical compendium, is like trying to lay out a new atlas, with national boundaries changing from week to week. For general introductions, I refer the reader to F. R. Moulton, *Introd. to Astron.*, new ed., 1912; H. Jacoby, *Astronomy*, 1913; *Adolpho Stahl Lectures in Astron.*, Astron. Soc. of Pacific, 1919. For methods and results of Astrophysics: G. E. Hale, *Study of Stellar Evol.*, 1908; W. W. Campbell, *Stellar Motions*, 1913; A. S. Eddington, *Stellar Movements and the Struc. of the Univ.*, 1914. For cosmogony: T. J. J. See, *Researches on Evol. of Stellar Syst's*, vol. 2, 1910, rather dogmatic; S. Arrhenius, *Worlds in the Making*, 1908; *Destinies of the Stars*, 1918; J. H. Jeans, *Problems of Cosmogony and Stellar Dynamics*, 1919. For Geology: T. C. Chamberlin, *Origin of the Earth*, 1916; F. W. Clarke, *Data of Geochemistry*, 4th ed., 1920; L. V. Pirrson and Chas. Schuchert, *Text Book of Geol.*, 1915; Lull, etc., *Evol. of the Earth*, 1918.

ever that is, would tend to draw the stars together in ever-growing masses. But this is probably balanced by the scattering influences of electrical repulsion, radiation pressure, and perhaps explosion. Particles of star dust, escaping from the gaseous stars, form dark nebulous clouds. These in turn condense to make new heavenly bodies. Some features of our present Universe point toward an earlier stage, many hundreds of million years ago, when the material later made into stars formed an undifferentiated mass of rarified gas.

When we pass from the metropolis and its suburbs to the country districts, we find two dominant types of heavenly bodies. The spiral nebulæ, of which about half a million have been detected, are apparently moving away from the Galaxy with great velocity. The condensed globular clusters of stars—86 of them according to the latest count—are moving toward the Milky Way, and come closest to it on the opposite side.

How are we to regard these extra-galactic or rural groups? Each globular cluster appears to be a separate and complete system. Do they represent other universes? Shapley considers them rather as appendages of the Milky Way. They are miniature galaxies, rather than coequals. The Hercules cluster, for example, has a diameter of only 1100 light years, with a limited number of stars. In a later paper he attacks the question of the spiral nebulæ, and reaches a similar conclusion. They must be regarded as genuine nebulæ, rather than as collections of stars which form "island universes." [2]

Do these spirals and clusters represent the outlying portions of our Universe, and suggest its order of magnitude? Or is the Universe infinite in extent, and filled with an infinite number of stars? The light which reaches us from the stars as a whole is limited. On this ground the majority of astronomers had decided a few years ago in favor of a finite Universe. The question was reopened,

[2] *Public's of Astronom. Soc. of Pacific*, Oct., 1919.

with the discovery of a certain amount of star dust in inter-stellar space. This suggested the possibility of a "fog," as Turner calls it, which cuts off part of the light. But Shapley has shown that there is no appreciable absorption of light in any part of the sky.[3] If our telescopes can penetrate to over 200,000 light years, it is hard to see how any great amount of light can be cut off by fog. Apparently we are forced back to the conception of a finite Universe, with definite though vastly extended boundaries. This, in connection with the relativity principle, may require the revision of many of our ideas of thermodynamics.[4]

By way of parenthesis, I may remark that the question of a finite or an infinite Universe has no bearing on the Christian hypothesis, except to determine the particular form which must be assigned to God in His physical manifestation. Infinity is purely a spatial term. Space, if we accept Einstein's principle, is not a frame of reference, but a series of relations. A finite Universe is one whose relations are capable of measurement. An infinite Universe would be a Universe whose relations extend so far that we cannot expect to measure them with any instruments at our command. Whether God, in His physical manifestation, is measurable or unmeasurable, is a question of fact, which Astronomy alone can settle.

Another equally futile question is whether the history and arrangement of the Universe gives any indication of an intelligent plan. Thus far Astronomy has done little more than draw up working theories which may serve as guides for further investigation. We do not know what is the arrangement of units and forces within the stellar

[3] *Observatory*, Feb., 1919. Lebedew came to the same conclusion a few years ago, from a study of light waves. Kapteyn's studies appear to point to the selective absorption of certain rays, the redness of the stars increasing with their distance. *Astrophys. J.*, 29, 46, 1909; 30, 284, 1909; 40, 187, 1914.

[4] This subject is discussed briefly in my *Unfolding Universe*, 57-60.

Universe, either in the present or the past. The dogmatism of the 19th century cosmic philosophers would be entirely out of place. Until astronomers give us this necessary knowledge, it is premature to discuss the plan of the stellar world. Personally I doubt whether the question will ever be in order. The Universe is here, to be accepted and studied, rather than criticized. Man's reason is a very inadequate standard. It is of little value to know whether the actual system is an intelligent arrangement, such as would be made by the person who asks whether it is intelligent.

Let us pass to a more specific question: the possibility of life on other worlds. It is quite common to assume that the earth is not unique in this regard. Dr. See, for example, speaks of "millions of similar [solar] systems, with habitable planets, which may now be confidently inferred to exist in the immensity of space." Arrhenius makes the same assumption, and on it bases his new theory of panspermism. Wallace, in his very able book on *Man's Place in the Universe*,[5] argued against this, on the law of probability. It will be well to restate Wallace's argument, with the modifications in detail due to our advancing knowledge.

What are the factors necessary for the development of protoplasmic life, the only life we know? Reducing Wallace's table to somewhat simpler terms, we may name four essential conditions. (*a*) A mean temperature well above the freezing point, and not in excess of about 73° C. (*b*) Water in sufficient quantity, and uniformly distributed. (*c*) An atmosphere with an ample supply of carbon dioxide, and, for higher forms of life, free oxygen. (*d*) Sufficient nitrogen or nitrogen compounds, carried from the air into moist earth or standing water.

The presence and maintenance of these factors require a heat producing body of approximately the temperature and distance of the sun; a planetary mass sufficient to retain a

[5] Alfred Russel Wallace, 3rd ed., 1905.

dense atmosphere and hydrosphere; and volcanic action of the earth's crust that will keep up the supply of carbon dioxide. These conditions the earth has fulfilled during the geologic period, usually estimated (both from the depth of sedimentary rocks and from the amount of salt in the ocean) as 100 million years. Have the conditions been met elsewhere?

None of the other members of our solar system are capable of supporting life. The larger planets are masses of gas. Mercury, and probably Venus, always presents the same face to the sun. Mars, the only promising candidate, now is considered to have a mean summer temperature at the equator of —27° C.[6] Its mass, approximately one-tenth that of the earth, is not sufficient to retain an atmosphere and hydrosphere. The so-called "canals" are merely volcanic fissures. Changing colors are not due to vegetation, but to various salts and oxides, either dry or in solution. The attempt of Lowell and others to show the habitability of Mars, has not been creditable to Science. Able astronomers let their imaginations run riot, and proved anything they wished to prove, amid deafening applause from the galleries.

We must guard against similar credulity in regard to habitable planets in other parts of the sky. Of the immense number of bright stars, very few appear to have duplicated the conditions of our solar system. A hundred million years is the time we have assigned to the organic history of the earth. Careful calculation shows that during this period only a little over 2000 stars are likely to have had close encounters with other stars.[7] Only a small proportion of these encounters would have produced planetary systems. Of the planets thus formed, not all would furnish the conditions found on our earth.

Wallace's argument, as I have restated it, seems to me to be against the probability of the simultaneous exist-

[6] Arrhenius, *Destinies of the Stars*, 1918, chap. 6.
[7] See Appendix C. *Habitable Planets among the Stars?*

ence of another habitable planet. In the immense stretch of astronomical time the case is somewhat altered. A recurrence of the conditions found on the earth is possible, we might say probable. When low forms of life began on our earth, 100 million years ago, a race of men on some distant planet may have been just ending their planetary career. That is if life always follows in the Universe, when the conditions necessary for life are met.

If the general probabilities are what I have stated, it is not necessary to consider Arrhenius' ingenious revival of the theory that spores from other inhabited worlds emigrated to our earth through inter-stellar space. Even if such transfer were possible, spores are far too scarce an article to fit the case. At best, this solution would only push the problem one step farther back. The origin of life still demands explanation.

The present biological situation, in the light of our conception of the Universe as dynamic rather than material, calls for an entirely different line of approach. I recur to the idea which strongly appealed to Haeckel, though stated by him with many dogmatisms and inconsistencies. The Universe which we know as physical, is at the same time endowed with the properties which appear to us as organic and psychical. To put it in another way, the forces of the Universe will, under certain conditions, interact with the electron groups which we call Matter, in the various forms of living protoplasm.

Just what are the conditions of such interaction, the terms on which the physical may become the organic, we do not know. But we may hope to learn. The general hypothesis I have stated, which may be called the working theory of present-day Biology, has certain practical advantages. It offers a clue for investigation. It may conceivably be verified by experiment. Definite chemical theories of life's origin are as yet tentative, we might say premature. They need not be discussed in detail. I merely refer the reader to Woodruff's excellent summary

of five recent suggestions: Pflüger's cyanogen theory, Moore's law of increasing physical complexity, Allen's primitive nitrogen compounds, Troland's enzyme theory, and Osborn's mutually attractive colloids.[8]

Each important discovery serves to narrow the problem. As we gain surer knowledge of the structure and activities of one-celled organisms, as we unravel, step by step, the marvellous complexity of the albumin molecules which appear to be the basis of protoplasm, as we learn the chemical nature of enzymes and other agents of the cell,—we may expect some day to know and recreate the conditions of organic life. It may never be possible to construct in the laboratory even the simplest cell. But it is within the bounds of possibility that we shall be able to put together some of the simpler aggregations of molecules from which the cell has grown, and see them showing quasi-biotic activities.

Such a goal is the inspiration of the modern scientist. The worker in Biology believes himself to be tracing the beginnings of that process of organic action and interaction which forms one of the most fascinating mysteries of our mysterious Universe. He might well say, with the great astronomer, "I think Thy thoughts after Thee." The religious idea, as stated in the pictorial language of primitive thought, that God breathed into clay the breath of life, is entirely consistent with the scientific statement that, under certain conditions, carbon compounds show new properties and behavior which we call organic. In

[8] L. L. Woodruff, in *Evolution of the Earth*, 1918, lecture 3; E. Pflüger, *Arch. f. d. ges. Physiol.*, vol. 10, 1875; Benj. Moore, *Origin and Nature of Life*, 1912; F. J. Allen, *What is Life?* Birmingham Nat. Hist. and Philos. Soc., 11, 44, 1899; L. T. Troland, *Monist*, 24, 92, 1914; and H. F. Osborn, *Origin and Evol. of Life*, 1917, 67 *ff.* To these should be added the osmosis theory of Stéphanne Leduc, *Mechanism of Life*, Eng. trans., 1911. See also articles by E. A. Schäfer and H. E. Armstrong, reprinted in *Smithsonian Inst. Report*, 1912, 493, 527; E. A. Minchin, *Evolution of the Cell*, Am. Naturalist, 50, pp. 1, 106, 270, 1916; Felix le Dantec, *Nature and Origin of Life*, Eng. trans., 1906.

fact, if we believe that God is revealed to us in the physical Universe, the two statements are identical.

Man's place in the Universe is not a question of stellar geography, or of the number of inhabited worlds. The moral value of human life, the achievements of the human mind, the development of a social order,—these retain the place which they held at the beginning of the Christian era. The Christian hypothesis is not affected by the expanding idea of the world. Modern Astronomy has merely given human life a larger perspective. Man has become indeed a cosmopolitan. The Universe of his adjustment has taken grander outlines. Our God is a greater God, He no longer is localized or provincial. But He is the same God. The very uniformity of Nature must give the Universe an identical character, whether on the foothills of an earthly Galilee or in the recesses of Orion.

VI.

THE UNIVERSE UNFOLDING.

In the background of the previous discussion another question has been lurking. Christianity asserts a goal in organic creation. God works for a definite end: the making and perfecting of Man. Is such teleology consistent with the facts of Biology as we know them? This is the third test of the Christian hypothesis.

The general idea of evolution, rather than special creation, is entirely consistent with the conception of the Universe which we have already reached. In fact, no other view harmonizes with Jesus' idea of God's activity in Nature. The Master himself suggested the method of gradual unfolding, though he had no basis for applying it to biology. If we accept the doctrine of organic evolution, and conceive of God as working from within rather than without, we should be prepared to take the consequences. One of these is that the God revealed through Biology must be the same as the God revealed by Christ. Otherwise the Christian theory of the Universe would fail to square with the fact. Man is the culmination of a long evolutionary process. Was this an accident, or was it an inevitable result of the forces involved? Let me review the question of the origin of species as it stands today.[1]

In evolutionary theory, the extreme Darwinians held the field for two generations. The origin of species was

[1] A good elementary treatment will be found in John M. Coulter, *Evolution, Heredity and Eugenics*, 1916; and, with M. C. Coulter, *Plant Genetics*, 1918. See also R. C. Punett, *Mendelism*, 5th ed., 1919; T. H. Morgan, *Evolution and Adaptation*, 1903; *Physical Basis of Inheritance*, 1919; W. Bateson, *Problems of Genetics*, 1913.

attributed to minute fluctuations, in size, color, form and organs. These, if of any advantage in the intense struggle for existence, were perpetuated by natural selection. The individuals lacking this small advantage were exterminated. These selected organisms were in turn subject to fluctuation and selection. The net result was a slow but definite modification of structure, by which they became better adapted to surrounding conditions. Continued long enough, and with the environment changing from time to time, the process was supposed to bring into being the millions of distinct varieties and species found on our planet. Progress represented the summation of a series of fortunate accidents. Natural Selection was the *deus ex machina.* The successful individual or species was a sort of juggernaut, riding to power over the bleeding bodies of those that had failed in the struggle, proved themselves unfitted to survive. It was a complete though cruel picture. Some biologists still hold to it *in toto;* parts of it must be retained on any theory. The doctrine of progress through struggle left a deep and in many ways unfortunate impression on the thought of our age. The World War was a logical consequence of the idea that you must kill off your competitors in order to survive.

Another era began in 1900, with the rediscovery of Mendel's principle of unit characters, and de Vries' study of mutations in the evening primrose. The new school of Biology differs from the old in three important particulars. In the first place, the study of genetics is on an experimental basis. The specific characters of plant and animal groups must be determined, not by surface resemblances, but through breeding experiments in the laboratory. Mendel's law makes possible the manipulation and control of the various factors which are brought out by crossing and segregated in line breeding. Secondly, attention is directed, not to fluctuations, but to true variations, which have their seat in the germ cell. Johannsen showed that in a pure line, though the size fluctuated con-

stantly, the differences were not inherited, and could not be selected in a way to affect the mean of the race. The modern plant or animal breeder goes deeper, and works with heritable factors. These may be either recombinations or mutations.[2]

In the third place, the mutationist school has given up hunting for reasons why the new form is better fitted to survive. Adaptation is no longer the sole criterion for species making. Struggle has no necessary connection with progress. The new characters that appear may be of distinct advantage to the organism, and again they may not. If mutations or new combinations manage to secure a foothold, they will live on side by side with the older and possibly more adaptable type. Nature is a very hospitable host.[3] Advance in structure has probably been by large rather than small steps. It is only in the case of a new factor which represents marked improvement in adaptation, that selection tends to weed out older forms. The one-toed horse displaced the two-toed horse, very much as the pneumatic tire displaced the solid rubber tire on the bicycle.

This shift of scientific opinion not only cuts the ground from under the competition theory, in its applications to man's social history. It enables us to take the organic world as we find it, in its infinite and fascinating variety, without that inventing of imaginary means to serve hypothetical ends, which vitiated the whole Darwinian school, as it did the earlier school of Paley. If there is teleology in Nature, it is not of the pure natural selection brand. The one-toed horse is a one-toed horse because a certain recombination of factors in its germ plasm, with which

[2] See Appendix D. *The Emergence of a New Species.*

[3] Survival is chiefly a question of fortunate location, or of individual reproductive power and general vigor, and in cross-fertilized plants the most vigorous individuals are hybrids. Pure lines are largely man's creation. Most of the forms which have been made or discovered in the laboratory, and used for starting new lines, would not have been selected automatically by Nature.

selection was not concerned, gave it one toe on each foot instead of two.

What are these factors, or "genes," which lie at the basis of the origin of species, and which the plant breeder is able to some extent to manipulate? We do not know, any more than the chemist, up to a few years ago, knew the nature of the elements he mixed in his test tubes. I mean this comparison to suggest two things. The progress of Science may be expected to throw definite light on the problem. And the solution is likely to be found in the field of organic chemistry. Castle, whose return to the mutationist ranks is an event of the greatest importance, states that the result of his recent experiments with piebald rats "favors the widely accepted view that the single gene is not subject to fluctuating variability, but is stable like a chemical compound of definite composition, and changes only similarly, by definite steps." [4]

From the standpoint of Physics, which no physical phenomena can escape, organisms represent the transformation of familiar and measurable energies, and the rearrangement of equally familiar atoms and molecules. The transformations and arrangments are of very much greater complexity than in the organic field. But they are the same in kind, and follow the same laws. Recent literature bears eloquent witness to this general fact.[5] There is a growing impression that evolution, whether in stars or crystals, in colloids or organisms, is one process, which in all its phases is equally characteristic of the Universe.[6]

If the environment of the organism is physico-chemical, and the germ cell is itself a physico-chemical phenomenon, variation, like life itself, must be due to the interaction of these two sets of closely related factors. In this regard the religious and scientific standpoints are identical, since our knowledge of God's method in Evolution is derived

[4] W. E. Castle, *Proc. Nat. Acad. Sci.*, 5, 126, 1919.

[5] See Appendix E. *Chemistry and the Organism.*

[6] This view has been ably presented by L. J. Henderson, *Fitness of the Environment*, 1913; *Order of Nature*, 1917.

solely from the study of Nature. It is not necessary to suppose that God acts through a hypothetical entelechy or vital force. When we once recognize the essentially dynamic character of the physical Universe, God may act equally well through an enzyme or an amino acid.

I ask the reader to hold in abeyance the question as to whether variation, which lies at the basis of the origin of species, is anything more than the interaction of one part of the Universe with another. We are concerned in this chapter with the question of Teleology in regard to the evolutionary process as a whole. In discussing Chaos or Cosmos, it is vitally important to know whether organic history represents team-work toward a definite goal, or whether it is a free-for-all that only happens to arrive anywhere. We do not ask at this point what the organism is in itself, or how we are to explain the element of "behavior," the apparent striving of the living unit toward specific ends. In the next section of our book I shall take up the problem of the Individual.

From our present point of view, organic evolution is an "energy traffic," to use Allen's term, through the medium of organic machines, of ever increasing complexity. The most complete development of this idea is that of Osborn, in his *Origin and Evolution of Life.*[1] Beginning with the Bacteria, which are able to capture the energy in certain chemical elements, we pass to the Algæ, whose acquirement of chlorophyll makes it possible to transform the energy in solar rays. The Plants represent a higher development of this function. At a later stage, the Protozoa, through their better chemical equipment, break up the energy already accumulated by the bacteria and algæ on which they feed. This type of energy transformer is developed further in the many-celled animals, which likewise depend on organic material, largely green plants. The

[1] H. F. Osborn, 1917. A brief outline of this theory is given in Appendix F, *The Evolution of the Organic Machine. Cf.* D. M. S. Watson, *Science Progress*, 11, 216, 1916; Richard S. Lull, in *Evol. of the Earth*, 1918, lecture 4.

process culminates in the various Vertebrate types. These show an increasingly complex and adaptable mechanism for transforming the energy stored in the food supply. As Osborn puts it, "the solar energy transformed into the chemical potential energy of the compounds of carbon, hydrogen, and oxygen in the plants is transformed by the animal into motion and heat and then dissipated. Thus in the life cycle we observe both the conservation and the degradation of energy, corresponding with the first and second laws of thermodynamics." [8]

In the development of this energy traffic, we note three parallel series of changes. The first is that of the physical environment. It is necessary to keep constantly in mind the geologic fluctuations which have taken place during these hundred million years or more. The readjustment of the earth's surface, due to shrinkage of the planetary mass, brought periodic changes, both in the character of the land and in the distribution of land and water areas. At the beginning of each geologic era, we see the re-elevation of continental mountain ranges. This was accompanied by a cold period, which disarranged all organic life. At least six of these major crises are known. Minor readjustments of the earth's crust brought radical if less severe changes in climate.

Corresponding with these physical changes are those in the general life environment. Each period of the history has its characteristic fauna and flora. The organism must face new enemies, whether predatory creatures or disease-bearing parasites. The food supply is altered: in variety, quantity and distribution. In the Cenozoic era, for example, the emergence of warm-blooded Mammals seems to be associated with the rise of flowering plants and grasses. The drying up of central Asia, at a later period, compelled the early Primates to descend from the trees.

The third line of change, with which we are specially concerned, is that in the organic machine itself. The

[8] *Op. cit.*, 53.

situation, particularly at certain epochs, put a premium on adaptability. This might take the direction of improved chemical equipment, which made it possible for the organism to utilize new types of food. It might lie along the line of greater disease-resistance. It might represent an improved mechanism, whether for capturing food, for escaping enemies, or for producing or protecting offspring. Each geologic crisis is marked by the scrapping of much of the previous machinery. "The rulers of the various domains find themselves overtrained and overspecialized, and succumb one after another to the changing environment. Their places are taken by the small, less specialized, and heretofore little known stocks, which quickly adapt themselves to their environments and become the dominators of the organisms about them. In all of this unceasing organic struggle most of the unadaptive families fail to continue; others are pushed by the pulse of life into the less desirable places, where they continue to live as static forms—the living fossils that tell us so much that is most interesting of once prominent stocks of plants and animals; but at all times much of life quickly responds to the changing environment and is remodelled into the more fit, active, and alert types." [9]

Whatever the explanation may be, students of Paleontology are agreed that the evolutionary changes in any type have tended to show progressive adaptation. The emphasis or suppression of earlier structures or proportions has been more or less continuous, involving small successive changes. The jaw of the horse may be used as an example. Taking first the premolars, no horse from the Lower Eocene has been found with any fully molariform teeth. All horses from the Middle Eocene have two molariform teeth in the lower jaw. From the Upper Eocene, all horses have four such teeth. In the Oligocene they have six. Turning to the molars, older horses, as in the Oligocene, have brachyodont teeth without cement. All Miocene

[9] Chas. Schuchert, in *Evol. of the Earth*, 1918, 81.

horses are progressively hypsodont, with a progressive increase in the amount of cement. The milk teeth of Miocene horses have practically no cement. Those of all Pliocene and later horses are heavily cemented.[10]

Something of the same process appears to have been going on in the evolution of the nervous system. Only the last steps in the long and fascinating story can be suggested here. The arboreal life of the early Primates favored a high development of the senses of vision, touch and hearing, with the corresponding brain areas. Compelled by further geologic changes to descend to the ground, a partly erect attitude and walking gait allow the development of the hands and fingers. This in turn brings further growth and specialization of the brain. The Neanderthal race, which flourished in Europe in the early Pleistocene (perhaps 800,000 years ago), stands erect, has a well-developed opposable thumb, and the brain centers controlling the motions of the limbs, hands and fingers are well developed. There is only a rudimentary development of the anterior centers of the brain, associated with speech and ideation. By the Aurignacean age, placed by Osborn at 25,000 years ago, but probably very much earlier, *Homo Sapiens* possesses his full powers.[11]

Our interpretation of organic evolution as the perfecting of a physico-chemical mechanism, correlated with an environment of the same essential character, is of course only provisional. But it has the advantage of being stated in the same terms that are now being used for the origin of life.[12] Let us see where this interpretation leads us.

It is perfectly clear that God did not plan out the details of creation, as a human executive would lay out a scheme

[10] Wm. K. Gregory, *Am. Naturalist*, 50, 622, 1917, with quotation from W. D. Matthew. The series of evolutionary changes mentioned may have covered a period of 12 million years.

[11] H. F. Osborn, *Men of the Old Stone Age*, 3rd ed., 1918; G. Elliot Smith, *Evolution of Man*, reprinted in Smithsonian Inst. Report, 1912, 553; Jos. Barrell, *Sci. Monthly*, 4, 16, 1917.

[12] See *ante* p. 49.

of development, to be put through according to a certain schedule. Nor can we think of the result as a matter of chance. The Universe arrives. The perfecting of the animal food supply makes possible the evolution of animal life. A growing adaptability to changing environments culminates in the intelligent mastery of the earth by the human species. If there is life on other worlds, we have every reason to suppose that organic evolution would follow parallel lines, and reach a similar specialization of the nervous system. But it has taken a hundred million years. And the Universe does its work in its own way.

The picture of God which we gain is not that of a great Engineer working from without, as in pre-Darwinian days. Nor is He the Supreme Judge of the Natural Selection theory, a sort of magnified Biometrician, an olympian Karl Pearson, measuring rival claims to adaptation and remorselessly sentencing to death the less successful. Rather we are led to think of a Divine Universe unfolding from within. The individual organism may be thought of as a part of the Whole, or as a semi-independent energy transformer, closely interacting with the Environment. In either case the transformation of known energies according to partially known laws, gives us a working explanation of organic history. We are not concerned here with the reason why the Universe unfolds, but merely with the fact that it does. Such self-expression appears entirely natural, and in harmony with what we know of God in His physical manifestation. Life does not behave like a cosmic blunder or accident.

This idea of a dynamic Universe unfolding from within, is what the Christian hypothesis really calls for. The process is not the chance aggregation of material particles, but the outworking of Divine forces. The simplest bacillus shows an assemblage of atom groups which we do not find in the entire inorganic world. In organization and potential power, the advance from the amœba to the tyrant dinosaur, from the dinosaur to man, is like the development

of machinery from human muscle to the modern dynamo. The Universe of which man is in some sense a part, reveals throughout geologic history a growth in complexity, in variety, in the perfecting of form, in the adapting of means to ends, in the control of physical energy for further creation, before which we all stand in reverent wonder.

PART II.

THE RELATION OF MAN TO THE UNIVERSE.

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VII.

THE MAKING OF MAN.

How are we to think of a dynamic Universe, which shows also the phenomena of evolving Life? Two general views are possible. There are divergent tendencies of thought, which may be called respectively Monism and Pluralism. Whether we follow the first or the second will make a good deal of difference in the place we give to Man as an individual.

The monist puts it in this way. The Universe is an all-inclusive unity, the sum total of what we know as God, Matter, Life and Mind—the Whole of which we are a part, and to whose completeness we may perhaps contribute. This theory has taken many forms. In Religion it appears as Pantheism. God is Himself the All, and my life is a current in the great ocean of His life. Such an interpretation is fascinating to many minds. It gives logical symmetry to the apparently disjointed facts of the world. It offers a kind of Nirvana to the distracted, hard-pressed spirit of man. Reality is an Absolute Monarch, to whom we should submit. The Universe must take the final responsibility for evil and pain.

Pluralism likewise has taken many forms. The contrasting theory which I wish to consider makes the present Universe a social order. It asserts the dignity and worth

of the individual man, as he faces the external world. As Pascal said: "Though the Universe crush me, I am greater than the Universe. For I can know of my defeat, but the Universe can never know of its victory." "Under the bludgeonings of chance," shouts Henley, "my head is bloody, but unbowed." Yet it is not necessary to shake one's fist at the Universe. If man with his unconquerable soul is a part of it, he has a responsibility for its shaping and its final outcome. He shares the defeats and the victories. The static unity of the monist becomes an unfolding social order, a Republic of conscious units. With the external world, which the Christian calls a manifestation of God, with this vast dynamic system upon which the individual is so closely dependent, man's relation is not one of subjection but of coöperation. The Universe has ceased to be a despotism.

Christianity holds to this latter theory. Man not only communes with God through Nature. He coöperates with God in Nature. With the general truth of this position the Christian hypothesis must stand or fall.

In this and succeeding chapters, I shall sketch various human activities and functions, which suggest what we might term the democratic character of the Universe. Our journey will be a somewhat long and rambling one; I trust it will not be without interest. We cannot hurry through the daily life of Man as if we were intellectual Cook's tourists. For convenience I shall continue to call the two rival theories Pluralism and Monism. The exact connection between the external world and God lies outside of this book, though our discussion will illustrate Jesus' idea of God as present in every aspect of our daily adjustment.[1]

[1] I also leave undetermined the relation of the lower organisms to the Universe. (See the opposite views of the individual held by T. H. Morgan, *Phys. Basis of Heredity*, 1919; Jacques Loeb, *Organism as a Whole*, 1916; and Wm. E. Ritter, *Unity of the Organism*, 1919.) These show a creative activity that is somewhat similar

Our first evidence for the coöperative character of the Universe appears in the making of Man himself. In the perpetuation of the race, we find him sharing creation at its highest. Man's part in this task begins with procreation. The normal function of men and women is parenthood. On the voluntary union of the sexes depends the very existence of the human units which represent the climax of organic evolution.

It is not strange that the fact of sex is one of the dominating factors in human history. Taking its rise in the earliest forms of life, as an alternative to other forms of reproduction, it soon becomes a normal differentiation of function. The sexual instincts evolve side by side with the changes in structure. Whatever the forms of courtship or of union, the fundamental facts, when studied under the microscope, are everywhere strangely similar. In Man, as in the plants and animals that share his world, the sperm brings to the egg the stimulus to reproduction. Each contributes one-half of the factors which determine the character of the new life. And at once, through the action of God's physico-chemical forces, there begins in the body of the mother that marvellous development by which the single fertilized cell becomes a complete reproduction of the parents, able to take its part in the creation of the world. No act is more sacred, more essentially religious. As Bryan Hooker sings, of the fathers dead in the World War:

> For the flower from the clod emerging
> And the fire from the cloud released,
> For the wife that is more than virgin
> And the man that is more than beast;
> For the spirit in strange communion
> With earth, yet more than earth—

but very much less developed. If the Universe has changed from Monism to Pluralism, as human activities seem to show, we might expect the differentiation to be by gradual steps.

The mystery of union,
  The miracle of birth—
For these, and what holier dreaming
  Our dust and its deeds have meant,
You are the blood redeeming—
  You are the Sacrament.

Jesus' practical emphasis on the sacredness of marriage and sexual passion finds expression in Paul's words, that the human body is a temple of the Holy Spirit, never to be desecrated or defiled. The sex impulse is to be controlled, and if necessary subordinated and diverted. But it is to be used, not outlawed. Biology has strengthened rather than weakened this position. Religion stands on solid ground when it considers every union of sperm and egg cells the creation of a new life, sacred as all human life is sacred, whose wilful destruction is murder, and when it regards any such union of cells that does not aim at reproduction as a sin against God the Creator. The act itself has been a prayer for the creation of a new life. So great is the responsibility for this share in the creative act, that it demands the wisest planning, and the freest and fullest coöperation. The prevention of conception follows of necessity, if we recognize that voluntary and temperate intercourse in marriage, the sharing of mutual passion with one another and with God, is an act of worship, of the highest moral and spiritual value.

The facts indicate that this principle of sex relations, given by Jesus, is a law written into the very structure of the Universe. Every instinct has a biological value, and that of sexual desire is linked with God in the Divine work of creation. The parity of the sexes in monogamous marriage, and the restriction of intercourse to those who enter this relation, is the result of a long series of experiments in the history of the race. Wherever the principle of creative coöperation has been followed, it has meant the moral elevation of manhood, of womanhood, of child-

hood. Wherever it has been disobeyed, in loose sexual relations or in prostitution, the result has been the degradation of a vast multitude of women, the loss of self-control and physical virility in men, and a spread of sexual disease that has lowered the birth-rate and left a heritage of diseased or abnormal offspring. That which is one of the primal religious impulses degenerates into lust and obscenity. Failure to adjust ourselves to the Universe, through the proper functioning of the sex instinct, is sin, and the wages of sin is death. The removal of the causes of prostitution and abnormal desire, the sublimation of this natural impulse, the opening of other channels for its expression—this is one of the greatest tasks which a Christian civilization faces.[2]

We hear much today of the science of Eugenics. It will be well for us to consider both its possibilities and its limits.

There are laws of heredity in the Universe, just as truly as there are laws of chemical combination or physical stress. What is present in the germ plasm of the parents will reappear in their children. Conversely, we cannot transmit anything that we do not ourselves possess. The characters and abilities acquired by father and mother in the course of their lives, do not modify the germ and sperm cells, and so cannot be handed on. From our present evidence, it seems probable that the embryo is not definitely affected by the environment, except through malnutrition or direct poisoning. The child will start at birth about where its parents started at their birth.

[2] Jane Addams, *The Spirit of Youth and the City Streets*, 1909; A. A. Brill, *Psychoanalysis*, 2nd ed., 1914. For other subjects treated in this chapter, see W. J. Robinson, *Birth Control*, 1917; Paul Popenoe and R. J. Johnson, *Applied Eugenics*, 1918, somewhat polemical in tone, but judicious and avoiding the errors of previous works; E. G. Conklin, *Heredity and Environment*, 1915; Franz Boas, *Mind of Primitive Man*, 1911; John B. Watson, *Behavior*, 1914; Chas. W. Waddle, *Introd. to Child Psychology*, 1918; Wm. McDougall, *Social Psychology*, 13th ed., 1918; Maurice Parmelee, *Science of Human Behavior*, 1913.

Thus far it has not been possible to resolve into definite factors the many complex influences which determine the inheritance of physical and mental traits. We know too little to lay down definite rules such as those used by the plant or animal breeder. All we can say is that the responsibility for healthy mating rests heavily upon the individual and upon Society. Other things being equal, the child which at birth is the most perfect physical animal has a better chance all through its life.

Studies of American school children, and later of soldiers, by the Binet-Simon and other tests, have shown a very wide range of intelligence, grading all the way from idiocy to genius, the greatest number coming near the middle of the scale. Counting 100 as normal, Terman found 2% of school children testing 128 or above, 2% testing 73 or below, and 60% ranging from 91 to 110. Similar results have appeared when tests were made for special lines of mental ability. Temperament probably varies in the same way, though an adequate system of classification is not at hand. Proper allowance must be made for other contributing factors. But the differences appear to be in the main congenital. From a biological standpoint, all men are not created equal.

Differences in temperament and mental ability are not correlated with physical features, in normal cases. They must be attributed to independent series of mutations. Every so-called "race" is composed of an almost unlimited number of strains. The same climatic influences or geographic isolation which brought about the average differences in physical type, might result in average differences in temperament and intelligence.

Doubtless man's evolution is continuous. Favorable, and unfavorable, mutations and recombinations may occur here and there, in any group. Each person born is a new individual type. But the net result is the same. There will be no Supermen. The success of government and mission schools among the lowest savage tribes, indicates that

the mean intelligence of *Homo Sapiens* has not been raised by any process of natural selection.[3] Intelligence varies the world over because it always has varied, and such differences are inherited. Present deviations from the mean are not altered by immigration, but only redistributed. We hope for more children from the more intelligent individuals and groups, and fewer children from the less intelligent. Civilization needs leaders, and it needs the highest possible average. But any healthy strain has valuable contributions to make to the human capital of the Universe.

Statistical studies bear out the statement that the mean intelligence of the race remains at about the same level. Although the mating of persons of high or low intelligence may raise or lower the average for several generations, the "drag" of previous ancestry and intermarriage with other grades tend to bring the group back toward the mean. In the statistical laws of inheritance worked out by Pearson, the expected contribution of the parents is given as .6244. That of grandparents is .1988, and of great-grandparents .0630. As stated by East and Jones, "the brightest examples of inherent mental ability have come and will come from chance mating in the general population, the common people so-called, because of the variability there existent."[4] The task of Eugenics is to encourage the reproduction of those members of society who show superior mental traits, and to check the reproduction of those whose mental power is abnormally low. To work for either of these ends is aid in the Divine work of creation. The problem cannot be met merely by selective mating, and the willingness of superior stocks to bear offspring. It involves the whole range of social questions. War enters into it, as do commerce and taxation. We must also pay attention to housing, health, the relation between in-

[3] To give a single example, Porteus' tests of aboriginal children in Australia show an average deviation of only five months from the standard for whites. *Psychol. Review*, 24, 32, 1917.

[4] *Inbreeding and Outbreeding*, 1919, 244.

comes and cost of living, education, opportunities for social life, and the proper treatment of defectives and delinquents.

But the making of Man has only begun at birth. These individuals, of many physical types, with various temperaments, with different degrees of congenital mental capacity, are so much raw material which Society is to mold into the finished product. The child is born with a completed body, but a very incomplete brain. His nerve-cells, or neurones, are in place, with all their latent potentialities. Some of them are fully developed, making possible the instinctive reflexes of the new-born child. But the majority, especially the neurones of the cerebral hemispheres, are yet unfinished. They must extend their branches, and develop their insulating sheaths. The association neurones, which have appeared latest in the history of evolution, will be the last to complete their growth. Although this development is largely carried out by God, along the lines laid down by heredity, the plasticity of the child brain gives the individual and those responsible for his training a chance for coöperation of the most definite kind.

The fundamental distinction between man and his first cousins among the higher mammals, like the gorilla and chimpanzee, is not in physical features, or in the size and arrangement of the brain. It lies rather in what man is able to teach his brain to do, by virtue of his inheriting a well developed speech mechanism. In early infancy, the child trains certain centers in his left brain, if he is right-handed, or in his right brain, if he is left-handed; for the training is done largely through the use of the hand in feeling and gesturing. By the training of these centers, he is able to name his mental recepts and achieve ideas and spoken words, as the gorilla cannot. He learns to write, to play musical instruments, to operate elaborate machines. The gorilla species, in other respects, has practically as good machinery in the brain as the human

species. But being without a speech mechanism in throat and brain, it lacks the power, and always did lack the power, and always will, to develop the rest of the cerebral machinery and put it to the fullest use. The normal human baby possesses that power. He will inevitably become a thinking being. He persists in training his hands. We could not prevent him from talking, even if he must make a language of his own.

This distinguishing feature in Man, the training of one of the hemispheres of the brain, takes place after birth. It continues for about sixteen years, and to some extent through life. For each individual, the limits of such training are set by heredity. But the training itself is a matter of environment, of the child's surroundings and schooling. Up to the point where development is possible, man makes his own brain. He shapes his own character. He determines his own relations with the Universe. As Dr. Thompson has said: "While all individuals of our race are not born with equally good brains, yet the fact remains that the special mental capacities for which certain men have become eminent were all acquired and were not congenital." [5]

All education must be self-education. But the guiding of it is a sacred function, a coöperation with God in the greatest of all tasks. A pedagogical revolution is slowly going forward, due to the influence of Rousseau, Froebel and Pestalozzi. Education is coming to be a process of natural growth, rather than the acquiring of a certain amount of information. It is not "something to be forced upon children and youth from without, but is the growth of capacities with which human beings are endowed at birth." [6]

[5] Wm. M. Thomson, *Brain and Personality*, 1908, 233.

[6] John and Evelyn Dewey, *Schools of Tomorrow*, 1915, 2. See also John Dewey, *Democracy and Education*, 1916; E. L. Thorndike, *Educational Psychol.*, 1913; Frank N. Freeman, *How Children Learn*, 1917; E. P. Cubberley, *Public Education in the U. S.*, 1919; Alexander Inglis, *Prin's of Secondary Education*, 1918.

To fail in developing the full capacity of any human child, of whatever race, is to block the work of creation, or leave it only half completed. Terman's studies show that individuals with an Intelligence Quotient of 70 may reach a mental age of 11, or an equivalent of fifth grade work in school. An I. Q. of 80 represents a mental age of 12½, or seventh grade. "A large proportion of the tasks in the modern organization of industries can be as well performed by individuals of the 70 or 75 I. Q. class as by those of superior intelligence, and with more satisfaction in the performance. Mentality of eleven years is ample for ordinary kinds of unskilled labor, and many of the semi-skilled trades are within reach of those who test a year or two higher. To make the most of this grade of ability, however, it must be trained. For children who test below 75 or 80 I. Q., genuine vocational training should largely replace the usual curriculum of the upper grammar grades." He instances M., a Portuguese boy, leaving school at 16, after struggling painfully through the sixth grade. His mental age is 10½, and his Intelligence Quotient 72. He cannot be rated as feeble-minded. "About ordinary affairs his judgment is dependable, and he is steady, industrious and anxious to make good. There are probably many kinds of semi-skilled work in which he could succeed. For none of these has he received any preparation. After nine years in school, he faces the world with no vocational asset but his God-given brawn. There are approximately a million children like M. in the public schools of the United States." [7]

Vocational training has a broader aspect. All children, of lower or higher intelligence, need guidance in their choice of a life work, and adequate preparation for it. They must learn to adjust themselves to the present industrial and democratic era. There is a growing feeling among progressive educators that the mere trade school does not meet the situation. The demands of industry

[7] L. M. Terman, *Intelligence of School Children*, 1919, 133 *f.*

and of citizenship cannot be met without broad and universal equipment. "The democracy which proclaims equality of opportunity as its ideal requires an education in which learning and social application, ideas and practice, work and recognition of the meaning of what is done, are united from the beginning and for all." [8]

In this coöperative task, the influence of the home, of the church, of the play life, of associates and surroundings, must rank with that of the trained teacher. We are coming to learn that the making of man is an extremely complex process, involving a constant interaction between human instincts craving expression, and the social environment which encourages or hinders such expression. Take, for example, Parker's analysis of the Western hobo. "The history of the migratory workers shows that starting with the long hours and dreary winters of the farms they ran away from, or the sour-smelling bunk-house in a coal village, through their character-debasing experience with the drifting 'hire and fire' life in the industries, on to the vicious social and economic life of the winter unemployed, their training predetermined but one outcome, and the environment produced its type." [9] Repression of the natural instincts of children and adults is fraught with grave danger to Society as well as to the subject. It leads either to weakness, inefficiency and moral debasement; or compensation is sought in some more or less violent form of revolt.

Since man became man, 400,000 years ago, the real evolution of the race, as we shall see in the following chapters, has been the evolution of social equipment: the gathering of an increasing store of ideas and experience, of tools, institutions, customs, outlets for expression, which are at the service of each child born into the tribe or nation. Herein lies the primary advantage of the civilized

[8] *Schools of Tomorrow*, 315. See later p. 205. For Vocational Guidance: Meyer Bloomfield, *Youth, School and Vocation*, 1915.
[9] Carleton H. Parker, *The Casual Laborer*, 1920, 123.

child, at its best, over the savage, of the child from a good home over the child from the slum or the backwoods. It is born into an inheritance larger, richer, more fitted to express man's instinctive desires and reactions, and destined to become still better and more general, as God's partners in Creation rise up to mold the conditions under which children are born, and men and women live their lives.

In regard to many points in this chapter, there may be difference of opinion. But the differences would affect the distribution of the several factors involved, rather than the general situation. The making of Man is not an event but a process. And in that process the human race has a definite and responsible share. At any point, men are able to alter the creative work, to check it or reverse it. Creation, instead of being completed at a certain prehistoric date, is going on before our eyes. The hundred million years of organic evolution, which gave us man's body, are as nothing compared with the coöperative evolution in the life of each human child, which gives us his mind, trained or untrained, stunted and warped and marred, or developed and broadened and ennobled.

VIII.

BUILDING THE WORLD OF THOUGHT.

When I enter the University Library, I have a realizing sense of the powers of the human mind. On the shelves are books and periodicals ranging over the whole field of human interest. Each year new knowledge is added to the rapidly growing accumulation. Scientific reviews record from month to month the work of thousands of investigators, in every civilized country.

Man has not been content to take the world for granted. His mental adjustment to the Universe has been of a very active kind. There is nothing to suggest the unfolding of a Universal Mind, the varied consciousness of one instantaneous Knower, a mosaic of Thought whose pattern is eternally complete in what Royce terms "the unity of the Absolute Experience." The picture we gain is rather that of a multitude of independent creators, slowly becoming acquainted with the Universe in which they are placed, and building out of it a world of objects and values and laws. Man does not make the Universe, but he makes it known.[1]

Let us look more closely at the nature of this adjustment. It begins in a most practical fashion. The world in which man lives contains various forces and bodies with which he comes in contact. Light waves, impinging on

[1] Any one wishing to follow further the themes treated in this chapter might consult with profit: W. B. Pillsbury, *Fundamentals of Psychology*, 1916; James R. Angell, *Psychology*, 1904; Hugo Münsterberg, *Psychology*, 1914; C. S. Sherrington, *Integrative Action of the Nervous System*, 1911; Boris Sidis, *Foundations of Normal and Abnormal Psychol.*, 1914; Joseph Jastrow, *The Subconscious*, 1906; Kate Gordon, *Esthetics*, 1909.

these bodies, are reflected toward him. Through the evolution of his animal ancestors in such a world, the human child inherits machinery for receiving and recording such contacts with the Universe, and reacting to them in definite ways. Innumerable reactions teach him to correlate these sense impressions, to compare them, to generalize them into recepts and concepts. And by means of these concepts, which language makes it possible to name, he forms his interpretation of the world, in terms of things and their qualities. This interpretation is so familiar that we are likely to take it for granted, regard it as preordained and always existing. On the contrary, it is man's own creation, a mental mechanism, a series of intellectual short-cuts, which enable him to know the Universe and adapt himself to it. The Universe supplies the raw material for thought: light and sound waves, forces and masses, relations and sequences. Man works up this raw material into objects and attributes, judgments of value, associations, inferences. It is a very real coöperation between Man and his Environment. The correspondence of our ideas with the external world is not a preëstablished but an achieved harmony.

What a mighty creation is a word. What magic power it brings. To pick out an object from experience, or the experience itself, make an abstraction of it, choose a certain sound to be its name. Merely by speaking that name, to call up in the minds of one's fellows a picture of the object, with all its dreaded or desired qualities. To name a thing, to have an idea of it, is to detach it from the confused unknown, to gain a certain advantage over it, to possess it, to make it a stepping-stone to other discoveries and possessions. The idea is man's own, having no existence until he formed it, with no meaning except such as he chooses to give. The word was not, until, by the exercise of a god-like power, man spoke and it began to be, as his messenger and servant. And through these simple but serviceable tools of thought, shared as part

of the common stock of horde or tribe, and constantly increased and perfected by new experiences, the savage is able to live his life, to predict the future, to subdue the earth to his need, to develop customs and institutions and sagas and myths.

And Civilization is merely the improvement of these same mental tools, which the race has been using for some 400,000 years. We still pick out certain facts of experience, which are revealed to us through our God-given sense impressions, and call them things, attributing to them certain qualities and behavior. We still create new names for new experiences. But the rapid accumulation of knowledge, recorded now in written and printed speech, has not only increased our supply of tools. It has enabled us to use them more accurately. We have formed new abstractions, and made wider generalizations. We group our experiences into general laws. By means of these laws, which are as truly man's creation as the first spoken word, we are able to make new predictions, to know the forces of the Universe and harness them for our use, to test and correct our sense impressions, to construct physical mechanisms that open the way to further power and achievement, to expand sagas into literatures, and myths into philosophies. Man has begun to know and utilize the Universe. But it is only a beginning. A hundred years hence the books on our library shelves, as a picture of the real world, will seem as crude as the books of a century ago appear to the scholars of today.

Knowledge is a means to an end, and that end is man's adjustment to the Universe. We must know it, for we live in it. We must know its physical forces before we can harness them. We must know its moral forces, before we can shape our lives and our institutions aright. Of this I shall speak at length in the closing section of our book. With the growing specialization in scientific research and teaching, there is grave danger that we shall lose sight of the Universe itself, of which these subjects are but

"abstracted phases and elements." The aim of a finished education, as Small pointed out over twenty years ago, is "conscious conformity of individuals to the coherent cosmic reality of which they are parts. Until our pedagogy rests upon a more intelligent cosmic foundation, and especially upon a more complete synthesis of social philosophy, we can hardly expect curricula to correspond with the essential conditions to which human action must learn to conform." [2]

The coöperation between Man and God in mental labor has an even more intimate phase. Activity of the brain represents a definite transformation of energy. A stimulus is transmitted along the branches of a neurone, and across the gaps that separate it from other neurones. The necessary energy must be supplied by the oxidation of carbon in the nerve cell proper. Active thought means increased blood pressure and temperature on the surface of the brain. Thus all mental processes may be considered as joint operations, between the thinker who initiates or controls the train of thought, and the Universe whose forces make such activity possible.

Our mental life may be passive as well as active, involving no conscious effort and no noticeable increase in blood pressure. In fact, by far the larger part of it is of this character. Probably the neurones of the brain cortex are in a state of incessant activity, even during the hours of sleep. They are constantly transforming energy and transmitting stimuli. Just what proportion of the resulting thought product is contributed respectively by God and by man, we do not know. It is clear that man, in his thought life, whether active or passive, is intimately dependent on the Universe. But while much of his thinking *appears* to be done for him, in the subconscious operations of the brain, the man himself, in his conscious personality, makes a definite contribution to the final result.

Every person engaged in literature or research learns

[2] Albion W. Small, *Am. J. of Sociol.*, 2, 840, 1897.

to distinguish these two kinds of mental operations. During his waking hours, he is conscious of having certain experiences, of talking with other men, of reading printed pages, of making definite experiments, of wrestling with problems of thought or expression. But all this time, beneath the threshold of consciousness, another stream of mental life is flowing. It is fed by his conscious thinking and experience, charged with images, ideas, impressions. The subconscious life, while preserving these intact as memories (or whatever lies at the basis of memory), also digests and develops them. And from this second stream of mental activity, as from a subterranean river, thoughts keep rising into consciousness. They may be mere feelings and prejudices. They may be remembered scenes or words. Sometimes the resurgence takes the form of matured ideas or new forms of phrasing. In my own experience, I wrestle for days over a problem, or leave a piece of work half finished and unsatisfying. After retiring for the night, or in the morning when only half awake, the problem is solved for me, the troublesome paragraph started with one or two telling sentences. The inspiration may come in the day time—when walking along the street, listening to a sermon, busy with mechanical tasks, working in my study on an entirely different subject. All my writing, when thoughts flow freely, seems like the work of an amanuensis, putting on paper the ideas that crowd up from the "undermind."

Probably all intuition and inspiration, in religion or literature, in science or practical affairs, is of this character. Literary history furnishes some extreme cases. Many of my readers are doubtless familiar with the story of Julia Ward Howe's *Battle Hymn of the Republic.* The visit to the Virginia battle-fields late in November, 1861. The singing of "John Brown's Body" on the slow drive home. James Freeman Clarke's suggestion that she write new words to that good air. Waking in the gray dawn of the following morning, the lines of the *Battle Hymn* formed

themselves in her mind. Fearful lest she should forget them she seized pen and paper, and scrawled the words almost without seeing what she did. When Mrs. Howe rose at daylight and dressed herself, she had no recollection of what had passed. Seeing some writing on the table she took it up, and recognized the words of her own poem: "Mine eyes have seen the glory of the coming of the Lord." [3]

Elliot has called attention to Herbert Spencer's "extraordinary power to see the essential elements in any heterogeneous mixture of events. He carved out a principle, which immediately introduced order and method, where previously there had been nothing but a hopeless jumble. . . . His methods of thinking and writing were wholly conformable with his character. He no more thought of sitting down to think than he thought of sitting down to read. In the course of promiscuous idling he would come across some significant fact or idea, which very likely he would temporarily forget. But later on it would be liable to turn up in his mind again, well on the way to being a full-fledged principle. And once the principle got rooted, relevant facts would come flying from all quarters, until on all that subject quite a considerable amount of knowledge had been more or less unintentionally accumulated. These processes apparently occurred with special strength while taking walks: on these occasions he was often absent-minded and noticed little of what was going on about him. He had of course immense natural concentration, but it was never brought on by an effort of will. His method of writing was of the same kind. The written matter flowed naturally from him, without conscious effort, and it was very little revised after being written. Unlike John Stuart Mill, who wrote out his

[3] *Bookman*, 32, 306, 1910. Francis Colton's version, also from Mrs. Howe herself, adds some interesting particulars; *Current Lit.*, 49, 677, 1910.

Logic many times before he was satisfied with it, Spencer never re-wrote." [4]

Mill's method of work is far more common. I have cited these exaggerated cases, because they bring out a process that is going on to some extent in all mental activity. The success of the thinker depends on his maintaining right relations between the conscious and the subconscious. To neglect or starve the subconscious leads to mental sterility. At the other extreme, the failure to control one's intuitions means weak or illogical generalization, somewhat parallel with the unchecked freedom of the subconscious in our dreams.

In successful thinking, the conscious personality does three principal things. In the first place it feeds the subconscious, by wide observation or reading. Mrs. Howe's poem grew out of long study of the best literary forms, and the brooding of a great personality over the crisis of her nation. Spencer's general laws came from a mind packed with miscellaneous information. Inspiration on a problem comes only after a period of hard study on that problem. Secondly, subconscious operations, to be fruitful, require the constant practice of similar conscious operations. The *Battle Hymn* resulted from the writing of many previous poems. Spencer's particular line of work had become an inveterate habit, which enlarged our knowledge in various fields. The third function of consciousness is definite control. New ideas are likely to spring up capriciously and without effort. To utilize an idea, however, to develop and phrase it properly, ordinarily requires the focussing of attention on that idea to the exclusion of everything else. Long practice makes it possible even to regulate the flow of ideas, so that the subconscious may be trained to work for us along one consciously chosen line. Mental enrichment, practice and concentration are the conditions of good thinking, and the at-

[4] Hugh S. R. Elliot, *Herbert Spencer*, 1917, 62.

tainment of these three things should be the goal of all education. Whether subconscious ideas are at times inspired directly by the God who is back of all the operations of the Universe, it is impossible to prove or disprove. The religious attitude of calmness and confidence, however, is conducive to the best thinking.

The constructive work of the human mind is shown most clearly in the field of Art. All æsthetic pleasure has a physical basis. Light waves of different lengths give rise to the sensations of color. And colors and their combinations have a varying emotional accompaniment. The pleasurable sensations of tone and overtone are due to the primary and secondary vibrations produced in the air by a sonorous body. A combination of tones is more enjoyable when the vibrations are in a certain ratio, as in the 1 to 2 of the octave, or the 3 to 4 of the fourth. The pleasure in bodily or vocal rhythm is largely muscular in origin. It is probable that line drawing and symmetrical arrangement bring a similar bodily reaction, what Grosse calls "sympathetic reproduction." As man lived his life, and found his varied activities bringing him these pleasurable sensations, he came to reproduce them for their own sake. He developed art, in order to objectify his emotion and express it to his fellows.[5] We see the beginning of the process in the rhythm of savage dances and songs. Through the manipulation of line and color, men were able to make pictures, as on the cave walls of prehistoric France, that would inspire definite suggestions and emotions. Still later came the use of simple tone combinations in crude musical instruments, recitative, and choral singing.

All art is social in origin and in expression. Historically man does not find beauty in the sounds or objects of the world around him. He makes satisfying tones or pictures, and later begins to apply his idea of beauty to Nature itself. The beauty is not, as with Hegel, an expression of the Absolute Thought in the concrete facts of the

[5] Y. Hirn, *Origins of Art*, 1900, 301.

world. It is rather a mental synthesis by the individual man, the product of his creative imagination. What we shall call beautiful is a social standard, determined by the taste of the group to which we belong.[6] The modern artist uses the same physical media as the savage, and for the same end. He seeks to give his artistic feelings an outlet, in a form that may be shared by others. He expresses emotion in the art language, and by the alphabet of signs, which the world has learned to read. With the growth of knowledge and taste, the improvements in mechanism and technique, man's creative power has attained a new perfection of harmony in tone or color or form, a fulness of emotional expression.

The artist differs from the average man in degree rather than in kind. We see a strong emotional temperament, and an unusual power of imagination, whether auditory, visual, or motor. Acquaintance with standard forms strengthens this primary endowment. Practice brings the artist his power of concentration. His mind is constantly creating, even when the creation is subconscious. Mozart's trained faculty enabled him to think in terms of musical compositions. The quintette in the *Magic Flute* is said to have come to him while playing a game of billiards. Croce tells us how "Leonardo shocked the prior of the convent delle Grazie by standing for days together opposite the 'Last Supper' without touching it with his brush. He remarked of this attitude 'that men of the most lofty genius, when they are doing the least work, are then the most active, seeking invention with their minds.' The painter is a painter, because he sees what others only feel or catch a glimpse of, but do not see." [7] But all appreciation of music or painting is essentially creative. The power vested in trained minds makes it possible for them to reproduce the synthesis first given by the artistic genius.

[6] James H. Tufts, *Genesis of Aesthetic Categories*, Univ. of Chicago Pub's, 1903, vol. 3.

[7] B. Croce, *Theory of Aesthetic*, Eng. trans., 1909, 16.

I have tried in this and the preceding chapter to steer a safe course between the various psychological schools. Our real interest has been in the product of thought, rather than the process. Whatever particular theories we may hold as to the conscious and the subconscious mental life, two facts stand out in clear relief. The first is contingency. The second is the power of independent creation. The philosopher in his study, the business man in his office, the workman at his lathe, the surgeon at the operating table, the artist, the musician—all are absolutely dependent on God. Apart from the Universe itself, without the energy exchanges in the brain cells, the nerve reactions, and perhaps the direct inspiration, their work would be impossible. But their work does change the result. Men are able to control their mental resources. By making and utilizing ideas and laws, they add something that was not on the earth before. They make man's adjustment more complete, his life more satisfying. A writer in *Science Progress* has branded as intellectual criminals "those who remain ignorant when they should learn, thoughtless when they should think, and sunk in superstitions when they should reason." [8] If Julia Ward Howe and Herbert Spencer and Da Vinci and Mozart had not lived, if they had developed lesser personalities, or failed to train their powers and use them to the full, the modern world would lose a heritage of patriotism and truth and beauty.

[8] 11, 136, 1916.

IX.

COMPLETING THE PHYSICAL WORLD.

To a certain extent the physical Universe is complete. Its laws do not change. The action of forces is definite, uniform, predictable. Two separated bodies always tend to gravitate together. Everywhere light travels in a vacuum a certain number of miles a second. The same number of electrons, grouped in the same way about a nucleus of positive electricity, show the properties of an atom of oxygen. Why natural forces should act in this way and not otherwise, we do not know. "I accept the Universe," said Margaret Fuller. There is no alternative.

The world of Nature being arranged in a particular way, our first duty is one of adaptation. Whether the present order is due to design, or whether organisms are fitted to the earth because they have developed in response to its conditions, this planet is a good place for man to live. He needs only to know his environment and adjust himself to it. And such honest, faithful, courageous adjustment is a coöperation of man with the Universe.

The uniformity of action in this sphere is of immense advantage. In fact, our life would be impossible on any other basis. How long could we exist in a world of disorder, where the succession of the seasons could not be predicted, where combustion was really spontaneous instead of following fixed laws, where sometimes chemical elements would combine, and at other times, under exactly the same conditions, combination failed? Such a world might suit the savage, but for civilized man it would be a bad dream; it could not be a reality.

As Roosevelt has said, the forces of Nature do not threaten; they operate. It is no ground for complaint that fire burns and cold freezes. Those who live in an earthquake belt, must expect occasional earthquakes. Those who live where cyclones occur, accept the risk of having property and perhaps life destroyed by this means. If a man builds his home at the foot of a live volcano, and the volcano erupts and buries the man and his family under a mass of lava, the man is responsible, not the Universe. In any part of the world, the rainfall or snowfall, the alternations of heat or cold, while varying from year to year, vary only within definite limits. Those who do not like that average rainfall or that temperature range, are free to move elsewhere. We witness many such hegiras, especially among the well-to-do. But in history the average family, instead of fleeing from conditions, has adapted itself to them. Through the use of fire and clothing, prehistoric man was able to leave the tropics and follow the receding glaciers, like the animals that he hunted. Emigration, after filling the more fertile areas of the temperate zone, has swept on into less favored regions. Men have learned to wrest a living from apparently barren soil, and even to irrigate the desert. Famine and disaster have taken an awful toll. But the conquest of the earth through adaptation, has trained the race in courage, in endurance, in resourcefulness, in thrift. I have seen this process at first hand, both among the New England hills and on one of the last timber frontiers of the West. The virility of the American is still the virility of the pioneer and his descendants. The strongest of our immigrants are those who in the Old World wrestled with Nature as Jacob wrestled with God for His blessing. That Man has succeeded in his adjustment to the Universe, is shown by the vastness of the earth's present population, and its spread from the Equator to the Arctic circles.

But Man has not merely adapted himself to the earth as he finds it. His mental equipment has enabled him to de-

velop and complete the earth. He has shared the Divine task of physical creation. The first tools and weapons were levers with which to move the world, and provide a richer and more dependable livelihood. The economic evolution of primitive man is one of the most fascinating stories in the history of the race. Invention and accumulation make for the advance of certain tribes, only to be wiped out again by disease or war. After many thousand years, a definite advance is registered in the domestication of the cow and the sheep, the development of agriculture, such arts as pottery and weaving. Weapons and tools are improved. Mines and factories are opened, for working flint and other valued articles. Houses become more elaborate. Such engineering feats are attempted as the circle of Stonehenge. As population grows denser, Man's creative adjustment to the physical world, always social in its character, becomes more highly organized. Bronze implements are introduced, to a civilization already well under way. Mining and manufacturing bring specialization; men begin to follow distinct trades. Commerce increases. Cities spring up. Then iron, and steel; the rest of the story is recorded history.

Men find themselves on an island, separated from the mainland by broad rivers. They learn to cross these by canoes, by ferry boats. Then they throw bridges over them; they tunnel beneath their surface. They cross oceans in ships, driven first by wind power and later by steam. Trails give place to roads, and these to cemented highways. Men lay rails across a continent for steam and electric traffic, filling valleys and boring through mountains. They flash messages around the world by wires, and even without wires. They learn to navigate under the water and through the air. They build structures of many stories, to which they are lifted swiftly against the force of gravity. They harness the energy stored in waterfalls and coal, in molecules and electrons, and use it to heat and light their houses and turn the wheels in their

factories. Whatever articles are needed to supply their wants, tools are ready, and tools to make tools. What hath Man wrought, in this last hundred years. Human achievement in the completion of the physical world, is an epic, far grander and worthier than the deeds of Homeric heroes or mediæval knights. And the work of creation goes forward, at an ever accelerating rate.

Man has succeeded, not in spite of Nature, but because of Nature. The forces of the physical world were on his side. They have been friendly, not hostile. Man has been able to work with the Universe, because the Universe ever was working with man. The material and power are supplied him; what he contributes is their knowledge and control. Through the oxidation of wood or coal, for example, people develop heat for their comfort or convenience. The laws of Physics and Chemistry are not broken. The equations of energy are unaltered. Man brings together forces and force-centers that existed previously. But he brings them together in new arrangements, and for the accomplishment of new ends.

Every workman is a creator, helping to direct Divine forces, working with God upon Divine materials. The miner, digging coal or iron, is following a holy calling. Every stroke of his pick is an act of unconscious communion with the Universe. His task is sacred, it is part of the social order. The comfort, the very life of God's children, depends on the product of his labor. To shirk is to prove traitor to man and to God. To do one's best is to hear, if one will, the "Well done, good and faithful servant." So with the laborer in the blast furnace, turning out steel for human use. The mechanic, making what God wants made. The worker in the building trades, helping to house man and his varied industries. The shipbuilder, the boilermaker, doing their part in the organization which make human commerce possible. The engineer or the seaman, making commerce actual. The farmer, feeding the world, of whom our next chapter will have

more to tell. The miller, putting the farmer's product into available form. The tradesman and his varied helpers, distributing the goods that people need. The housewife, preparing what her home should have of food and cleanliness and comfort. There are no secular callings. Steam and electricity are holy, and boiler plates and bolts of cloth and shoes and sacks of flour and dressed meats and dishes and laundered clothes. To come in contact with the objects and forces of the world of every day, is to come in contact with God in His incessant activity. The place whereon we stand, in factory or store or kitchen, is holy ground.

From a feudal aristocracy we have inherited the idea of a certain stigma attaching to hand labor. Such an attitude is virtual atheism. In itself hand labor is not degrading but ennobling. It should be practiced in our leisure hours and taught to our children. The mere contact with physical materials brings a satisfaction and a peace which are in the truest sense religious. Athletic sports are of the greatest importance, from the standpoint of health and recreation. But in the education of a people, sport cannot take the place of honest work. There can be no real democracy without a general participation in physical labor, as something honorable and intrinsically rewarding. Bulgaria, under Premier Stambolüsky, has introduced the plan of drafting young men, when they reach the age of conscription, for a period of education and service as laborers rather than soldiers.

William Morris defined real art as the expression by man of his pleasure in labor. He might have said the same of true religion. In useful work well done are all the elements of communion and worship and service. Creative tasks, when seen in a larger perspective, bring a certain self-forgetfulness. We have an example of this in the almost superhuman effort that can be made under stress of some great cause, as in making munitions or digging trenches. Absorption in some piece of creative work may bring the same oblivion to time and weariness and bodily

need. Something of the same attitude is possible in normal labor. Outside of muscular fatigue, what tires us is not the work we are doing, but the work we are not doing. Our mind is constantly chafing to be doing something else. On the other hand, work that is interesting is seldom tiring. In this case we are truly coöperating with God. Our mind is working in harmony with the Divine processes that go on in brain, nerve and muscle cells.

That religion in its broadest sense will ever become a general and sufficient motive for labor, is open to question. The chief compulsion has been and will continue to be economic necessity. But the sense of coöperation with the Universe for social ends may be made a supplementary motive, dignifying mechanical tasks, giving a new sacredness to materials, glorifying routine through the consciousness of the end to be attained, developing the satisfaction of craftsmanship.

To release this powerful supplementary motive in mechanical labor, many things are necessary. Hours of labor must be reduced below the point of physical exhaustion, and the fatigue due to monotony or nervous strain relieved by change of work or periods of rest. Proper provision must be made for lighting, ventilation, safety and comfort. The return in wages must not only provide a decent living, but be fairly representative of the worker's share in production. There must be security of tenure; the worker cannot be haunted by the fear of losing his job, or of becoming dependent in old age. Some means must be devised for giving an intelligent interest in the processes and management of the plant. Home conditions and the opportunity for wholesome recreation are of almost equal importance. And the worker must have the skill, the control over his own powers and over natural forces, the use of the best labor-saving machinery available, and the economical placing of materials and tools, which will make for the most efficient production. On no other terms can the workman have the consciousness of being a creator

rather than a drudge. Some of these conditions society at large is securing, through legislative enactment. Still more powerful is the recognition by the more progressive plants of the human factor in industry.[1] Booker Washington, in one of his books, pleads for the industrial education which will "teach the Negro how not to drudge in his work." He contrasts "the Negro in the South toiling through a field of oats with an old-fashioned reaper, with the white man on a modern farm in the West, sitting upon a modern 'harvester,' behind two spirited horses, with an umbrella over him, using a machine that cuts and binds the oats at the same time,—doing four times as much work as the black man with one-half the labor." [2]

Under any approach to ideal conditions, physical labor, like virtue, is its own reward. It brings returns which cannot be reckoned in dollars. "The real wages of life," says Atkins, "are in the strength which attends happy toil, in the comradeship born of a common endeavor for great ends—there is no finer friendship than the friendship of those who work together—in the sense of usefulness which attends all service and in the joy of creation which God shares with all good workmen. We are paid for our work in the happiness and well-being of others, in wholesome weariness which makes rest a blessing, in the hunger which gives a flavor to bread and the thirst which makes a cup of cold water the very gift of God. Discipline and skill, patience and power are coin struck from a mint whose gold is never tarnished—these also are the wages of toil, and beyond all these is character—the continuation and revelation of the great reward of labor in personality itself." [3]

The relations between Man and the Universe must be

[1] This subject will be taken up more fully in Chapters 18 and 19. See Frederick S. Lee, *The Human Machine and Industrial Efficiency*, 1918; Josephine Goldmark, *Fatigue and Efficiency*, 1912; Frank B. and Lillian M. Gilbreth, *Fatigue Study*, 2nd ed., 1919.

[2] *Future of the Am. Negro*, 1899, 62.

[3] G. G. Atkins, *Congregationalist*, Dec. 25, 1919.

learned, not through an abstract discussion of the nature of human consciousness, or of freedom *versus* determinism, but through a study of the difference which the individual man is able to make in the net result. That he is not a mere cog in the cosmic machine is shown by the reverse fact, that man may refuse to coöperate in the work of creation, or even destroy that which has been created by others. He may set fire to a building, or dynamite a printing office or a mine. He may limit production by unscientific or inhuman management, or by sabotage or a policy of "ca' canny." He may live in idleness on the productive work of others. He may hold land or water-power or mineral deposits undeveloped, in order to secure a larger unearned increment. He may plunge the world in a war that wastes more life and property than can be replaced in a generation. For such antics the theory of the Absolute offers no explanation. But both creation and destruction fit into the idea of a Universe which, since the emergence of the human species, has become a Pluralism rather than a Monism, a Democracy rather than an Absolute Monarchy.

X.

DEVELOPING THE FOOD SUPPLY.

What Man has done to perfect the organic world, will be seen if we trace the pedigree of some of the commonest articles on our table. I do not intend in this chapter to give practical directions for farming, but merely to review some examples of human creation and control which are no less remarkable because the end-products are so familiar.

We may begin with the meat and dairy products. Man's domestication of wild cattle in Neolithic times did much to change the course of social evolution. Wealth came to be "pecuniary," as with the early Latin, derived from *pecus,* cattle. By 3000 B. C. the Egyptians had not only developed a hornless from a horned breed, but had achieved a selective milk type.[1]

If it is the beefsteak we are considering, the story is probably that of the Shorthorn breed. It goes back to the valley of the Tees, in the English county of Durham, and the September day, in the year 1786, when Charles Colling of Ketton Hall made his historic visit to the home of his friend Maynard of Eryholme. As he and his wife rode up, their attention was at once attracted by a handsome roan cow which Miss Maynard was milking. Before the visit was over, this animal, a fine representative of the old Teesdale stock, was purchased for 28 guineas and renamed Lady Maynard, or, as an admiring countryside came to call her, "the beautiful Lady Maynard." She was destined to become the ancestress of the improved

[1] Jas. O. Breasted, *Sci. Monthly,* 9, 422, 1919.

Shorthorns. Still more important was the blood of a bull, bought by Charles Colling for 10 guineas, and sold after two years for 8 on account of his small size. He had no name until his progeny began to attract attention, when he was named Hubback, from a later owner. This bull of posthumous fame showed symmetry and even distribution of flesh, and a remarkably quick response to feeding. The union of these two strains, under the method of close in-breeding which Colling had learned from the great pioneer, Robert Bakewell of Dishley, produced the beef type he was seeking. Such bulls as Favorite, his grandson Comet, which sold afterward for $5000, and "the Durham Ox," which reached a weight of nearly 3400 pounds, made the improved breed famous throughout England. Still further developed by his brother Robert Colling, and by Thomas Booth and Thomas Bates, the Shorthorns or Durhams began to make their way to America, where they were to prove the favorite dual purpose breed. The fascinating and at times sensational story should be read in the pages of Mr. Alvin Sanders.[2]

Man has produced equally striking results with dairy cattle. In 1910 the average annual production of the American dairy cow was estimated by the Bureau of Animal Industry at 4000 pounds of milk, and 160 pounds of butter fat. Probably a quarter of the cows did not pay for the cost of keeping them, and nearly one-fourth more failed to yield a profit. To correct this situation, three lines of improvement are being followed: feeding, selection, and breeding. Experiments in Iowa showed that good feeding, as contrasted with poor feeding, more than doubled the total yield of young stock over a two-year period. The aim in scientific feeding is to supply each cow with the largest amount of grain she can use in milk production without putting on flesh. The rough and ready rule is to feed one pound of grain for every three pounds

[2] *Shorthorn Cattle*, 2nd ed., 1901; *At the Sign of the Stock Yard Inn*, 1915.

of milk produced, in addition to all the roughage the cow will eat up clean. Warmth, ventilation and general peace and contentment are also of great importance. Since individual cows vary greatly in their capacity for utilizing food above their maintenance, regular testing is necessary in order to weed out the less productive stock. At the Georgia Experiment Station, the best cow in the herd gave during twelve months 7,968 pounds of milk, which produced $115.44 of butter. The poorest cow gave only 2,788 pounds of milk, with a butter value of $41.63. Besides selecting individuals with the best production records, much can be accomplished by breeding up the herd. Let me refer again to experiments in Iowa. The introduction of pure-bred Holstein sires brought an increased production in the heifers, at an average age of three years and a half, over their scrub mothers at an average age of six years, of 71% in milk, and 42% in butterfat.[3]

While the production by good grade herds compares favorably with herds made up entirely of thoroughbreds, the possibilities in breeding can be seen from the world records made by pure-bred cattle. The Holstein cow Segis Pietertje Prospect, recently completed a year's production which showed 37,381.4 pounds of milk, or an average of about 50 quarts a day. At least six cows have passed the 30,000 mark. The butterfat record for this breed is held by a Canadian cow which rejoices in the name of Bella Pontiac, with 1,270 lbs., which is reckoned as 1,587.5 lbs. butter. For the Guernseys, Murne Cowan gave 24,008 lbs. milk, and Countess Prue 1,103.28 lbs. butterfat. The Ayrshire, Garclaugh May Mischief, produced 25,329 lbs. milk; and Lily of Willowmoor 955.56 lbs. butterfat. The Jersey records are held by Passport, with 19,694.8 lbs. milk; and Plain Mary with 1,040 lbs. butterfat.[4] Man

[3] Iowa Agric. Exp. Sta., *Bull. 165*, 1916; Clarence B. Lane, *Records of Dairy Cows*, U. S. Dept. Agr., Bur. An. Industry, *Bull. 75*, 1905.

[4] *Breeds of Dairy Cattle*, U. S. D. A., *Farmers Bulletin 893*, 1917, records corrected to Dec. 1, 1921. The Holstein milk record has been broken twice within two years.

has gone far in perfecting the cow as a machine for turning concentrated food materials into milk and fat. Breeding and feeding have produced similar records for hogs and poultry.

Normal milk contains various types of bacteria, one of which, the *lactis acidi,* causes fermentation with the mild acid flavor that we enjoy in our butter. In order to provide this uniform flavor, the butter-maker has pasteurized his cream to destroy the active bacteria of all sorts. He then adds a pure culture of the *lactis acidi,* allows the cream to ferment under its influence, churns it, works out the surplus water, salts and colors it to suit our taste, and the butter is kept at a low temperature until it is ready for the table. The creation of our cheese is somewhat more complicated. The cheese-maker is unable, in most cases, to make use of pasteurization, but he secures the desired fermentation by selecting whole milk in which *lactis acidi* predominate, and adding a pure culture. Rennin, extracted from the digestive stomach of a calf, is then introduced, to assist by its enzymes the digestion of the curd. The resulting flavor is due to some biologic action, not yet understood, but stimulated by the acids of fermentation, which are under definite control, and by the salt which is added. By changing the method of production, in some cases adding cultures of certain molds, the cheese-maker is able to vary the flavor and consistency, and produce over four hundred varieties.[5]

Our honey is a plant secretion, whose cane sugar is changed to grape sugar in the bee's body. Its flavor is determined by the flowers on which the bees forage. The aim of the bee-keeper has been to increase production. The *Italian* species is most generally used, owing to their comparative gentleness and disease-resistance, and the increased laying power of the queen. As all worker eggs

[5] E. G. Hastings, in Marshall's *Microbiology,* 1917, 408-437; C. F. Doane and H. W. Lawson, *Varieties of Cheese,* Bur. Animal Ind., *Bull. 105,* 1908.

are laid by the queen, and the life of the worker bee during the active season is not more than five or six weeks, all that is necessary for changing the breed is to secure a pure-bred *Italian* queen, which may be sent long distances by mail. The increase of honey production is secured through mechanical devices and manipulation. A hive is constructed with movable frames, on which are stretched sheets of wax foundation, stamped so as to furnish the bees with the six-sided bases of the proper size for building worker cells. The objective in modern bee-keeping is the strongest possible colony at the time of the main honey flow. Colonies of 100,000 bees are not unusual. To secure this, it is necessary to eliminate swarming. Instead of allowing the bees to waste their energy building up new colonies, man keeps them at work strengthening the main colony and gathering supplies. By the use of these methods, I have been able to secure an average surplus of 100 pounds of extracted honey per colony in a normal season. A yield of 200 pounds is common, and over 400 pounds has occasionally been realized as an average. Millions of tons of nectar go to waste annually, through the lack of honey bees to harvest it, under man's control. That such control is still inadequate, is shown by the fact that the average yield per colony in the United States is only 45 pounds of honey. Most of the smaller apiaries fall very much below this figure.

Our wheaten bread, if made from Minneapolis flour, has been ground from hard spring wheat, grown in the Red River valley. And thereby hangs an interesting tale of plant breeding. This most important of all cereal crops has been cultivated throughout historic times. The plant is in general self-fertilizing, allowing for the selection of pure lines by pedigree culture. W. M. Hays, of the Minnesota Experiment Station, began in 1888 to try out strains of wheat gathered from the United States and foreign countries. The *Blue Stem* and *Red Fife,* which had become indigenous to Minnesota were found most satisfac-

tory. In ten years' time, out of 552 wheats grown in trial plots, often from a single kernel, four hardy varieties had been secured, with a high gluten content and an average yield of 22.5 bushels per acre. At that time the producing capacity for the country as a whole was about 17 bushels. But the experimenter was not yet satisfied. From the best types already secured, 400 grains of wheat were planted in single hills in 1892, and a new series of 31 varieties secured. By 1894 about a pint of seed was available for each of these. At the end of the decade, the best of the new varieties, *Minnesota 163* and *169*, were beginning to be supplied to farmers. Their yield was approximately 28 bushels, making possible an increase of over 10 bushels per acre for the entire Northwest.[6]

The maize which enters our diet, directly or indirectly, differs from wheat in that it is normally cross-fertilized. At the Connecticut Experiment Station, D. F. Jones, continuing the work begun by East, has been able to isolate about a dozen pure lines. These in themselves lack vigor, but may be crossed to furnish new combinations of desirable qualities. The greatest success has been reached with a double cross. Mr. Jones showed me the small shrivelled ears of two strains of white dent corn, and the cross made of these, somewhat larger but still shrivelled. By combining with a similar cross of yellow dent strains, he secured a large perfect ear, which in the trial plots yielded an average of 112 bushels of shelled corn. The average yield on Connecticut farms, the highest in the country, is 44 bushels, the best farmers reaching about 75. The best record of the hybrid varieties used in the trial plots was 92 bushels. The 20% increase of the new combination was due to the elimination of bad heredity. Each plant produced an ear of corn, and this ear was perfect, ensuring a uniform production of grain. To take advantage of the new method, it will be necessary for the farmer to maintain special seed plots, securing a small quantity of

[6] Univ. of Minn. Ag. Exper. Station, *Bull. 62*, 1899.

seed from the two crosses, and planting in alternate rows. By detasseling the first row, its matured ears, fertilized by the second row, will be the desired double cross. This will furnish seed for the next year's planting.[7]

The same patient, enterprising coöperation with the Universe is seen in the adaptation and improvement of plants from distant countries, like the potato and the tomato, the navel orange, and countless garden flowers; in the grafting of improved varieties of fruit on old stocks; in the creation of new species, like the thornless edible cactus, which cost Burbank ten years of crossing and selection.[8]

In providing these various articles of food, Man has been actively engaged in improving the soil from which they come. In recent years his aim has been to make the fullest possible use of the microörganisms which are the chief factor in soil fertility. Some of these bacteria take up free nitrogen, and render it available for plant food. The most useful are those that attach themselves to the roots of clover and other legumes. By growing clover as part of the crop rotation, the nitrogen content of the soil is not only maintained but increased. Where necessary the clover seed is innoculated before planting, and lime added to the soil to stimulate bacterial action.

Other bacteria and molds decompose animal waste and dead organic matter, and thus make it again fitted for the use of plants. Careful treatment of liquid and solid manure enables this process to go on with the least possible loss. The application of manure, or the plowing under of green crops, supplies the soil bacteria with the food supply on which to continue their decomposition of the humus. Cultivation and drainage insure the amounts of moisture

[7] The reader is referred to Mr. Jones' report and bibliography in *J. of the Am. Soc. of Agronomy*, 12, 77, 1920.

[8] W. S. Harwood, *New Creations in Plant Life*, 1905, gives a popular review of Burbank's work. For a general review of the subject, see Babcock and Claussen, *Genetics in Agriculture*, 1918, with full bibliography.

and oxygen that are necessary for the greatest activity of the bacteria, as well as of the plant roots, in various soils. Still other microörganisms act, either directly or indirectly, to break up rock surfaces for the formation of new soil. They also transform various mineral compounds, supplying, for example, most of the potash needed for rapid plant growth. This most useful work is stimulated by the application of animal or green manures or commercial fertilizers.[9]

Through this active and intelligent control of bacterial action, Man has been able to restore the fertility of worn-out soils, to utilize apparently barren regions for crop production, and to increase soil-fertility, in spite of the amount of food material annually drawn from the land. New areas are constantly being made available for farming. The United States Reclamation Service has provided water for approximately 3 million acres of arid land. The general campaign for surface and tile drainage is beginning to reclaim the 80 to 100 million acres too wet for cultivation. Similar movements are going on in other parts of the world. As a consequence, the predictions of earlier economists are reversed, and Man appears to be increasing his food supply faster than the population increases. The species which can achieve such a result is not composed of automatons.

Professor Bailey, in his inspiring book on the *Holy Earth,* distinguishes three stages in our relation to the planet. The collecting stage of the hunter and fisherman is succeeding by the mining stage. The wealth of the earth is exploited without thought for future generations. There is no attempt to clean up the refuse heaps and heal the scars, and thus restore man's home to its pristine order and beauty. No one who looks on hillsides devastated by wasteful lumbering, would consider man a good housekeeper. "Farming has been very much a mining pro-

[9] Marshall's *Microbiology,* 1917, 289-363; Chas. W. Burkett, *Soils,* 1907.

cess, the utilizing of fertility easily at hand and the moving-on to lands unspoiled of quick potash and nitrogen." Finally we enter the productive stage, where we secure supplies by controlling the conditions of growth. The American farmer is learning, like his brother in Europe, to put back into the soil as much as he takes out of it. Farming begins to have "a range of responsible and permanent morals." [10]

One of the great social problems of our age is to insure a succession of efficient and contented farmers. Ownership *versus* tenantry, technical training, labor and labor-saving machinery, proper marketing, adequate financial returns, good roads, social advantages—all these enter into the solution of the problem. But still more fundamental is the question of inspiration and motive. Legally the farmer may be the owner of his land. Morally he is a trustee. He is engaged, as Bailey says, in a quasi-public business. He is the agent of Society to subdue the surface of the earth and increase its productiveness. And the daily work on the farm represents what is perhaps our most intimate contact with God's activities in the world around us. A man cannot be a good farmer unless he remembers man and remembers God.[11]

There is something inherently sacred in the earth which is man's principal source of food, in the fructifying power of moisture and sun, in the living organisms, lowlier members of a common evolution, whose life man is able to control, and put to use for the supplying of his needs. It is not surprising that people of an earlier culture worshipped many of these objects as sources of fertility, or as symbols of deity. The revival of Jesus' idea of God's activity in Nature should provide an outlet for this natural religious instinct, in terms that the modern world can understand. God is no longer an Absentee Landlord. He is our Partner in the great creative enterprise. The com-

[10] L. H. Bailey, *The Holy Earth*, 1915, 22.
[11] *Id.*, 32.

munion which the Nature-lover feels in flower and field and wood, rises in the life of the gardener or farmer to the height of definite coöperation. Food is essential to life. Civilization depends upon adequate and increasing food supply. Through the control of Divine forces of reproduction and growth, man works with God in this most elemental of all services to the race. In the words of Ingersoll: "To plow is to pray; to plant is to prophesy; and the harvest answers and fulfills."

XI.

THE CONTROL OF HEALTH

The life of any organism is contingent. It must adapt itself to the environment. It must continue to fulfill the conditions which make organic life possible. In the human species this adaptation is, to some extent, under conscious control. Successful adjustment to the Universe is health. Failure in adjustment means pain, sickness, and death. To charge suffering to God would be as absurd as to charge Him with the burning out of the fuse of the electric lights, when my eldest son tried some scientific experiments. If positive and negative wires are joined, a short circuit results. If a man overeats, it is liable to bring on an attack of biliousness. The Universe does not cause the biliousness, any more than it caused the short circuit. It merely lays down the conditions of successful or unsuccessful adjustment.

The question of Health brings into sharp relief the opposing theories of Monism and Pluralism which are before us in this section of our book. In Christian Science and similar pantheistic movements, the perfecting of the individual is practically his absorption in the Universe. God is represented as Perfect Health. To abide in health one must abide in God. Since God is also, for this school, the Absolute Mind, health is primarily a matter of mental harmony or discord. The aim of the healer is to exorcise sickness, by bringing the patient into an attitude of confidence, harmony and oneness with the Universe of which he is a part.

In this position there is much of truth and practical value, as we shall see. But a wider view of the field shows that the correct adjustment of man to the Universe is not merely mental. It is also structural, chemical and bacteriological. These factors are not mutually exclusive. Rather they supplement and shade into each other. The science of Medicine, in its four-fold aspect, is part of the creative achievement of the human mind which we have already discussed. In this chapter we shall apply such knowledge in some detail to the case of the individual man. Christianity, like other religions, has made valuable use of suggestion and faith. But the laws of health are laws of God. To know these laws and follow them is as much a religious duty as to follow the Ten Commandments. The forces of the Universe that make for health are at our command, but we are required to make active and intelligent use of them. Not to call on the best medical skill available, is to neglect some of the most notable coöperation of man with God.[1]

Since the human body is a physical machine, it is necessary to keep that machine intact, and in proper working order. Surgery attempts to correct man's adjustment on the physical side, whenever this has been disturbed by accident or other cause. A man's hand was severed in our local saw-mill, and hanging only by a piece of skin. Placing him under an anæsthetic, the surgeons in the hospital

[1] For any one who cares to follow further the subject of this chapter, the number of good books is legion. I suggest the following: John F. Binnie, *Manual of Operative Surgery*, 7th ed., 1916; Russell Howard, *Practice of Surgery*, 2nd ed., 1918; Albert P. Mathews, *Physiolog. Chemistry*, 2nd ed., 1916; Graham Lusk, *Science of Nutrition*, 3rd ed., 1917; Wm. Osler, *Principles and Practice of Medicine*, 8th ed., 1918; M. J. Rosenau, *Preventive Medicine and Hygiene*, 2nd ed., 1916; Wm. Brady, *Personal Health*, 1916; Irving Fisher and Eugene L. Fisk, *How to Live*, 1915; Edwin O. Jordan, *General Bacteriology*, 6th ed., 1918; Marshall's *Microbiology*, 2nd ed., 1917; Hans Zinsser, *Infection and Resistance*, 2nd ed., 1918; Paul Dubois, *Psychic Treatment of Nervous Disorders*, Eng. trans., 1907; Wm. A. White, *Prin's of Mental Hygiene*, 1917; Hugo Münsterberg, *Psychotherapy*, 1909; Richard C. Cabot, *What Men Live By*, 1914.

set the bones, and rejoined the nerves and blood-vessels. The natural forces of growth did the rest, and the man regained almost complete use of his hand. Where a limb cannot be saved, it is amputated, and the patient fitted with an artificial leg or arm. A tumor or a diseased appendix, which threaten the loss of life, may be removed. In the case of serious burns, skin may be grafted from another part of the body, or even from a different person. Sections of tissue and bone are transplanted. Transfusion of blood is also practiced. Manipulation or massage may restore normal circulation in obstructed nerves or muscles. The improvement of defective sight, or its compensation by artificial lenses, relieves eye-strain and saves health and efficiency. The science of Dentistry, supplementing proper care of the teeth, enables us to keep this important part of our anatomy functioning even to old age, and to avoid the poisoning of the blood or of the food material which results from decay. These are but samples of the repair of man's physical machine which the advance of Science has made possible. Passive absorption in the Absolute Mind does not provide new teeth or remove adenoids or restore severed hands. Surgery can only release the forces of assimilation and growth through which God operates in the physical organism. But man must do his part, on pain of death.

That man's corrective task is far from complete was shown by the examinations under the American army draft. Of two and a half million men examined under the first draft, 29% were rejected as unfit for active military service,[2] and nearly 30% of the two succeeding drafts. That is, practically a third of all American men are physically abnormal. It is interesting to note the classification made of nearly half a million disqualifications reported by local boards and camp surgeons.[3]

[2] Provost Marshall General, *First Report*, 1918, 44.
[3] Id., *Second Report*, 1919.

CAUSE FOR REJECTION	NUMBER	PER CENT
Total for all causes	467,694	100.00
Alcohol and drugs	2,007	.43
Bones and joints	57,744	12.35
Physical under-development	39,166	8.37
Digestive system	2,476	.53
Ears	20,465	4.38
Eyes	49,801	10.65
Flatfoot (pathological)	18,087	3.87
Genito-urinary (venereal)	6,235	1.33
Genito-urinary (non-venereal)	6,309	1.35
Heart and blood vessels	61,142	13.07
Hernia	28,268	6.04
Mental deficiency	24,514	5.24
Nervous and mental disorders	23,728	5.07
Respiratory (tuberculous)	40,533	8.67
Respiratory (non-tuberculous)	7,823	1.67
Skin	12,519	2.68
Teeth	14,793	3.16
Thyroid	8,215	1.78
Tuberculosis, non-respiratory	4,136	.88

The human body has its own power plant and its own chemical laboratory. The latter produces the enzymes needed for digesting and assimilating the different food elements, and for oxidizing the blood and lymph which are to replenish the energy of the various cells and carry off the waste. Given a fair chance, the organism will maintain its own chemical and thermal equilibrium. Air, food and water, exercise and sleep of the proper quality and amount, cleanliness, and the insulation of the body through clothing or warmed air, are all that is necessary, under normal conditions, to maintain perfect health. God provides them all. Man needs only to find them and use them, and the Divine forces in the organism will respond. The human body is indeed a temple, more sacred than any built with hands, where we may know the presence of the Highest, and witness the constant miracle of God's ac-

tivity. To be a faithful and worthy keeper of that temple is the holiest of callings. Ordinary sickness is a punishment for the sin of neglected duty.

At times, usually through some failure on man's part, the chemical equilibrium of the body is disturbed. A change in the amount or constitution of the food elements, or in the substances naturally eliminated from the system, radically alters the activities of the tissue cells, causing them to secrete toxins, or organic poisons. These affect the organism in various ways. The nutrition of the cells becomes insufficient. Their fats or carbohydrates may be used up too rapidly, bringing corresponding changes in the waste products. Sugar may accumulate in the blood, since the tissues are unable to absorb the usual amount. Congestion in the intestinal canal will cause further toxins to develop. The body soon gives those symptoms of sickness which are merely indications of changed metabolism. The internal nerve-endings send the danger signals which we know as pain. There may be heightened temperature, a cough, an attack of vomiting, a loss of appetite, a general feeling of lassitude. For the correction of these bad chemical conditions, man has learned the empirical use of drugs. Organs may be artificially stimulated, toxins counteracted, elimination improved. We know the end result, but practically nothing of the processes involved. The disturbance to the system is liable to be as great as the benefit. The tendency in modern Medicine is to consider such treatment merely an emergency measure. The real aim is to bring about such change in diet or other conditions as will give the body's own chemistry a chance to right itself.

The disturbance of the chemical equilibrium of the body may be due to microörganisms. The bacteria and other types which are responsible for infectious diseases, usually enter through the mouth or nose, or through wounds in the skin. When able to multiply, they generate toxins by their action on food materials and body cells. The toxins are

the direct cause of the disease, through the disturbance of functional activities.

Man's attack on these dangerous organisms, in the interest of health, has followed four lines. In the first place, our aim is to reduce the sources of infection, by isolating persons who may be carriers, and by destroying as far as possible the bacteria themselves. Of the success of this work we shall have more to say in the next chapter. In the second place, our effort is directed toward keeping the human body in the most perfect physical condition. Man has a natural power of disease resistance. With an unbroken skin, and ducts and hair follicles in normal condition, there is no danger of surface infection. The mucous membranes tend to protect the inner surfaces. Although disease germs are constantly present in the mouths of healthy persons, some of them are removed mechanically, and others checked or destroyed by the acid secretions in the mouth and other organs. The leucocytes, or white corpuscles of the blood, are active devourers of bacteria, after the latter have been rendered appetizing by contact with certain chemical substances in the body fluids known as opsonins. If a tissue has been injured, the leucocytes tend to gather around the infected spot and destroy the predatory organisms. This bodily reaction is known as inflammation. It often leads to the formation of a wall of cells that localizes the disturbance. When toxins develop, the natural tendency of the body is to develop antitoxins to combat them. The degree of immunity, general or specific, varies greatly with the individual, and with the state of health. Fifty per cent of all normal persons, for example, possess in their blood a natural antitoxin for diphtheria. A person who has had an infectious disease is usually immune to it afterward.

The third line of attack is the development of artificial immunity. Weakened or modified viruses known as vaccines, usually the dead bacteria in some form, are given, to stimulate the development of natural defences against

the disease. In antiserum treatment, the protective substances, instead of being developed in the body, are supplied from other animals, which have been innoculated with the disease. Sometimes, as in diphtheria, the serum injected is designed to neutralize the toxin. In other cases, for example pneumonia, the aim is to kill the bacteria themselves, directly or indirectly, and the serum does not create immunity. The advance in practice in this department of Medicine, with the knowledge of organic chemistry that lies behind it, must rank as one of the greatest achievements of Science.

Fourthly, we have the treatment of the disease after it has developed. The aim is to restore, as rapidly as possible, the patient's power of disease resistance. Antiserums and germicides are applied, when these will be useful. Diet, elimination and temperature are carefully regulated, and organs stimulated to renewed activity. In other words we do, under conditions of great disadvantage, what could have been done in most cases by preventive medicine and hygiene. To cure the sick, through scientific knowledge, shows the coöperation of man with God. Yet it is cooperation of a distinctly lower order than that involved in the preservation of health. The resulting adjustment to the Universe is far less certain and complete. It is like putting out a blaze in a rubbish-littered basement, when we might have kept the building in such condition that there would have been no fire.

In this connection a further employment of microörganisms may be mentioned. Metchnikoff made the discovery that ill health was due largely to putrefaction in the intestine, caused by certain bacteria. If we could replace these bacteria by others of a harmless type, health would be promoted and life prolonged. He claimed that it was possible to do this through feeding milk soured by the *Bacillus bulgaricus*. Metchnikoff's theory appeared in 1907, and was widely exploited. We know now that he had picked out the wrong organism. I have been able to follow

somewhat closely the series of experiments carried out in the Yale laboratories under the direction of Professor Rettger. They have demonstrated that the beneficial results are due to the *Bacillus acidophilus,* which is strikingly similar to the *bulgaricus* in appearance. When we feed milk soured by the former organism, it becomes predominant in the intestine and the putrefactive bacteria are eliminated. The experiments were made largely with white rats. All mammalian digestion follows a common line, and similar results have already been obtained with human beings. It seems probable that human digestive troubles will in future be controlled through the *Bacillus acidophilus,* by the addition of cultures to the normal diet.[4]

A person's state of mind is an important element in physical health. The connection is very close between conscious or subconscious thought and the system of nerves which control secretion and the distribution of blood. An idea may bring out tears or sweat, make the mouth water, cause blushing, pallor, cold hands or feet. Recent studies have shown that calmness, contentment and pleasureable emotion are necessary for perfect functioning of the digestive organs. On the other hand, worry, vexation, anger, fear, in fact any strong emotional excitement, will cause the secretion of adrenin from the adrenal glands. This in turn brings other bodily changes. Blood pressure is raised, and sugar increased in blood and urine. Saliva and gastric juices are no longer secreted. Contraction ceases in the muscles which move food through the stomach and intestines. The result is temporary or chronic indigestion, to which the name "emotional dyspepsia" has been given. At times, however, the secretion of adrenin under strong emotional excitement may have a physiological value. The increased blood supply, its diversion from certain areas, and its high energy content, make greater muscular activity possible. Heavy breathing gives room

[4] Leo F. Rettger and Harry A. Cheplin, *Transformation of the Intestinal Flora,* 1921.

for additional carbon dioxide in the blood. The adrenin relaxes the smooth muscles in the lungs, and in general acts as an antidote to fatigue. These values, which were vital in the struggles of primitive man, are utilized today in the exertion and excitement of athletic contests and other forms of active exercise.[5]

Medicine is now making use of this close connection between the mind, and the nervous system which regulates the activity of the body. Persons constantly make suggestions to themselves regarding their bodily condition. And these suggestions are being carried out, sometimes to a remarkable degree as in paralysis of the limbs or production of scars on the skin. In functional nervous troubles, the patient is not only liable to various mental delusions. Practically any organ or part of the body may be affected. The aim of the trained operator is to displace suggestions of sickness, and encourage suggestions of mental and physical health. The conscious personality of an adult is protected by a sort of armor, formed by the habits and frictions of daily experience. Beneath this are the subconscious depths to which reference was made in an earlier chapter. The problem is to pierce this armor and thus reach the undermind, with its immense possibilities for initiating new attitudes and controlling bodily changes. Sometimes this is done through a sudden shock. The undermind may be directly exposed, as in hypnotic sleep. Or casual conversation will give an entrance through indirect suggestion. To reach that mysterious region beneath the threshold of ordinary consciousness, is to hold at least one of the keys to health.[6]

The cures made in our psychiatric laboratories are paralleled by Christian Science and by the Roman Catholic shrine at Lourdes. In these cases the same method of suggestion is followed, although blindly and without ade-

[5] W. B. Cannon, *Bodily Changes in Pain, Hunger, Fear and Rage*, 1915.

[6] Percy Dearmer, *Body and Soul*, 1909, 135.

quate diagnosis. Religious faith is one of the important instruments used by the physician to counteract hysteria and morbid auto-suggestion. The rapid increase in nervous diseases has given increased importance to the work of the trained psychiatrist, and to the education of the public in mental hygiene.

But the value of suggestion is not confined to patients suffering from nervous disorders, as the records of healing cults abundantly testify. Through its vaso-motor nerve connections, the mind may exert a curative, as well as a pathological, influence on any function of the human organism. In fact there is no diseased process in the body that may not be retarded by ideas or emotions implanted in the patient's mind. I know from my own experience that it is possible by will-power and practice to reduce one's sensitiveness to pain and to exorcise many minor ailments. Mental treatment is not a substitute for surgery, chemistry or antitoxins. But since all cure as we have seen must be self cure, the recovery by the body of its normal equilibrium, a healthy attitude of mind undoubtedly operates to increase disease resistance and aid recovery. Every general practitioner acts on this principle. He seeks to stimulate hope and banish worry and fear. The use of specific suggestion, as a supplement to other means of cure, is likely to find an increasing place, as English and American doctors learn to overcome their unfortunate conservatism in regard to new methods of treatment.

Christianity, through most of its history, has healed the sick and cast out demons. This coöperation between man and God in the work of healing, has developed into the specialized professions of Medicine and Nursing, utilizing a growing body of scientific knowledge. The work is no less religious. It still represents the adjustment of human knowledge to the conditions of the Universe, the control by man of Divine forces making for health. And by inducing the attitude of mind that is essential to all successful

medical treatment, the religion of Jesus proves its value,[7] and perhaps its truth as well. To see in all the external world the activity of the ever present Father. To trust Him and love Him. To forget oneself in the work that needs to be done in God's world. To feel the beauty and joy of life; to win strength and satisfaction even from its struggles and losses and pains. To refuse to give way to hatred, fear, lust, greed, envy. To train one's mind to dwell on the good traits of one's fellows, on pleasant rather than unpleasant happenings, on health rather than on sickness, to think in terms of life and not of death. To see in every normal function of the body a meeting between man and God. To consider even one's sleep an act of communion, a relaxation from the strain of creative work in which we have shared, a time of recreation with the Father after a busy day.

A patient with such an attitude of mind is received with confidence at the operating table, if surgical treatment becomes necessary, and trusted by the doctor in a time of epidemic. He will have little occasion to consult the specialist on nervous disorders. Healthy thinking is a condition of healthy living. The Christian, like his Master, is in harmony with the Universe. He is living and working with the God on whom man, in his physical life, is so closely dependent.

[7] Helpful practical suggestions will be found in Chas. R. Brown, *Faith and Health*, 2nd ed., 1910; Oliver Huckel, *Mental Medicine*, 1909; H. Addington Bruce, *Nerve Control and How to Gain It*, 4th ed., 1919.

XII.

SHAPING THE COURSE OF PROVIDENCE.

In shaping the conditions of human life, the race has a growing responsibility. What we know as Providence is a matter of coöperation, in which Man claims an ever increasing share. The fatalist merely submits to the decrees of the Universe, as to a finished order. But civilized man is not a fatalist. He refuses to consider present conditions inevitable. Through the control of natural forces, he rises up to do his part with God in the prevention of accidents, the insurance against recurring dangers, and the improving of the environment.

Take, for example, that overshadowing dread of the region in which I have been living, the forest fire. It may start from bonfires, from the pipe of a careless settler, from an abandoned camp-fire creeping underground, from the sparks thrown out by a railway locomotive. Somebody is responsible, a human somebody. The settler must learn not to be careless with his land clearing, or the sportsman with his camp-fire. The railway must be compelled to burn oil instead of coal in forest regions, or to use proper spark arresters. The only case for which the Universe might be held responsible, is that of a fire caused by lightning; though a heavy wind may turn an apparently harmless fire into a terrible agency of destruction, as in the conflagration which swept northern Minnesota in 1918. But even in such cases, the fire can be held in check, kept from doing serious damage, by burning the slash, cutting fire lanes through the woods, and keeping a strong enough force of fire wardens patrolling the district.

The annual forest fire loss in the United States is estimated at $28,000,000, and the area burned over each year is ten times greater than the areas of France devastated by the War.[1] The measure of man's assumption of responsibility may be indicated by the following figures, taken from three government reservations, which have been in charge of technically trained forest supervisors since 1909. A comparison is made between the seasons of 1910 and 1919, which were the worst since the establishment of the Forest Service. The season of 1919 came as the culmination of three dry years. It also began earlier and continued six weeks longer than in 1910. As will be seen from the figures, the losses were reduced by scientific management from 93 to 97.5 per cent.[2] The protection given would be still more adequate, if the necessary funds were provided by Congress.

National Forest	Cœur d'Alene		Kaniksu		Lolo	
Area, acres....	790,234		702,405		1,181,018	
Calendar years	1910	1919	1910	1919	1910	1919
No. of fires....	272	113	38	89	133	332
Lightning	16	29	9	45	13	62
Human causes.	256	84	29	44	120	270
Total acreage burned	502,000	49,760	19,117	7,283	188,700	98,944
Total damage..	$6,975,000	$180,058	182,500	$9,858	$1,195,000	$84,460
Total cost of suppression .	$126,114	$200,653	$29,748	$26,870	$77,772	$290,674

The fire loss in our towns and cities reached the alarming total of $219,571,000 in 1919, or enough to pay for

[1] Figures furnished to Congress by Am. Forestry Ass'n, Feb. 22, 1920.

[2] The figures have been given me by J. G. Peters, of the U. S. Forest Service.

the Panama Canal in less than two years. Civilized man has developed elaborate machinery for putting out fires. And a system of insurance has been built up, by which the possibility of loss is carefully estimated and carried over a series of years. But such measures place a heavy burden on the community. In 1907 the fire hazard, including both the destruction of property and the excess cost of protection and insurance due to faulty construction, was estimated at $456,000,000, or nearly one-half the value of the buildings erected during the year. Man will not assume his full responsibility for this side of Providence, until he has solved the problem of fire prevention. Practically all conflagrations start from human carelessness. Of the 10,069 fires in New York City in 1911, the principal causes were as follows:

Carelessness with lighted matches	1,366
Children playing with matches	354
Carelessness with cigars or cigarettes	970
Carelessness with candles	409
Carelessness with gas lights, ranges, etc.	530
Overheated stoves, stovepipes, etc.	446
Chimney fires	509
Bonfires, brush fires, etc.	698
Spontaneous combustion of oily waste	102
Lamps, kerosene, gasoline, etc.	117
Electric wires, defective insulation	231
Vapor of benzine, gasoline, etc., igniting	209

There evidently is great need for the education of the public along this line, and the enforcement of strict regulations. Mr. Croker, after 27 years of active service in the New York Fire Department, states that every fire is preventable. Out of 12 million buildings in the United States, he estimates that 11 million have been built in entire disregard of the combustible nature of their materials. Present "fire-proof" construction aims at saving the building itself, even if the contents are destroyed. "Death-

proof" and "conflagration proof" should be added to the specifications, the flames being confined to a definite area by effective partitions. "Combustible and semi-combustible materials must be absolutely eliminated. If I had my way about it, I would not permit a piece of wood as big as a man's finger to be used in the construction of any building in the United States which had a ground area larger than 25 by 50 feet and was more than three stories in height." Automatic sprinkler systems, properly installed and maintained, reduce the fire risk from 50 to 80 per cent.

European cities furnish an instructive comparison with our own country and suggest the possibilities of man's control in the matter of fire. There is more widespread use of non-combustible materials. An older civilization has made the people more cautious. Fire marshals investigate the cause of every fire, which is considered a crime for which the guilty party must be punished. The fire losses in London and Paris in 1911 were respectively one-fifth and one-ninth that of New York. The per capita loss of $2.62 in the United States is reduced to $0.81 in France, and $0.53 in England. Cincinnati, with about the same population as Frankfort, Germany, shows a loss of $5.70 for each inhabitant, as compared with $0.31.[3]

While man has gained great advantage through discounting accident and death, as well as fire, by means of insurance, a real control of Providence requires the prevention of accidents and the prolongation of life. Much has already been accomplished in these directions.

Old age, which may be postponed by right living, but not prevented, brings a hardening of the arteries and a weakening of the various tissues and organs. Pearl has made an interesting biological classification of the normal causes of death, as given in standard mortality tables. He finds that human organs break down in the following order, the figures representing the number of deaths per 100,000

[3] Edw. F. Croker, *Fire Prevention*, 1912.

in the U. S. Registration Area from 1906-10:—respiratory system, 395.7; alimentary tract and associated organs, 334.9; circulatory system and blood, 209.8; nervous system and sense organs, 175.7; kidneys and related excretory organs, 107.2; primary and secondary sexual organs, 88.1; skeletal and muscular system, 12.6; skin, 10.1; endocrinal system, 1.5. The nervous system and skin, which have sprung from the original ectoderm layer and represent the greatest evolutionary adaptation, are responsible for only 14.3% of the deaths; the mesoderm group (skeleton, muscles, circulatory system, sex-organs, and kidneys) for 31.8%; and the endoderm group (respiratory system and alimentary tract), which has changed least, shows the alarming total of 53.9%. "Practically, all public health activities are directed toward overcoming the difficulties which arise because man carries about this antediluvian sort of endoderm. We endeavor to modify the environment, and soften its asperities down to the point where our own inefficient endocrinal mechanism can cope with them, by such methods as preventing bacteriological contamination of water, food and the like, warming the air we breathe, etc." Figures for England and Wales are similar to those for the United States. In the Brazilian state of San Paolo, however, where sanitation is less advanced, the percentage of deaths due to the break-down of the respiratory or alimentary systems, rises to 62.6.[4]

According to Dr. William J. Mayo, fifteen years have been added to the average length of life in this country since the close of the Civil War, with the prospect of adding another fifteen years, within the next two decades. He considers that 50 per cent of all sickness is preventable. It is the duty of the State to guard the health of its citizens through the prevention of disease. A nation is culpable if its citizens are allowed to become ill through manifest neglect. He cites the witness of the World War to

[4] Raymond Pearl, *Am. Naturalist*, 54, 5, 1920.

the triumph of modern Medicine. "For the first time in the history of wars, the number of deaths from casualties was greater than the number of deaths from disease. Eighty-five per cent (Billings) of the injured soldiers were able to return to the firing line, and 5% more were made fit for special or limited military duty in areas in the rear; in the Civil War nearly half the soldiers were out of the war permanently after injury, and a high percentage were at all times too ill from disease to render efficient service in battle. In the Spanish-American war one man died of gunshot wounds to 30 who died of disease. (Smart.)" [5] It is hard to realize the conditions in our hospitals before the days of Pasteur and Lister. Antiseptic and aseptic surgery have banished hospital gangrene, and robbed child-birth of much of its terror.

The past few years have seen a marked decrease in industrial accidents. This is due to the educating of employer and employee, and to the use of safer types of machinery. Between 1913 and 1917, the number of fatal accidents in industry fell from 25,000 to 22,000, an improvement of 12%; the number of serious accidents from 700,000 to 500,000, or 29%; and minor accidents, compelling absence from work for six weeks, from 300,000 to 226,000, or 26%. Society as a whole has made less progress. Of the 77,000 fatal accidents in the U. S. Registration Area in 1917 (one-seventh of these due to violence), 55,000 were outside of industrial operations.[6]

One of the most impressive demonstrations is that from the Panama Canal Zone. The laborers on the canal were largely Negroes, working outdoors with heavy machinery. The unhealthy climate was balanced by an exceptional control of conditions by the Army Medical Service. Dur-

[5] *N. Am. Review*, Feb., 1920.

[6] W. A. Evans, *J. of Industrial Hygiene*, 1, 397, 1919, from whom I quote also the following figures from Dr. Gorgas. See further, Wm. C. Gorgas, *Sanitation in Panama*, 1915; David S. Beyer, *Industrial Accident Prevention*, 1916.

ing the first year there was an epidemic of pneumonia; in the second year an increase of blasting and railroad work.

YEAR	EMPLOYEES	DEATH RATE	DISEASE	EXTERNAL CAUSES
1906	26,547	41.73	39.66	2.07
1907	39,238	28.74	25.44	4.30
1908	43,891	13.01	8.68	4.33
1909	47,167	10.64	7.55	3.09
1910	50,892	10.98	7.50	3.48
1911	48,876	11.02	7.65	3.38
1912	51,852	9.26	6.36	2.81
1913	56,654	8.35	5.24	3.11
1914	44,329	7.04	4.40	2.64
1915	34,785	5.77	4.05	1.72
1916	33,176	6.03	4.58	1.45
1917	32,589	7.09	5.74	1.35

The unsanitary conditions in the larger cities during the early part of the Industrial era are almost unbelievable. In the London of 1850, with a population of over two million, a third lived in houses unsupplied with water mains. Much of the water obtainable was unfit for human consumption. The city was seamed with open ditches, some of them of the most horrible description. Bethnal Green may be taken as a sample. With 33 miles of streets and 100 miles of by-ways, none were paved and only a few miles sewered. Slops were thrown from the windows, the streets being the common reservoir for refuse, which sometimes accumulated in great heaps. Scavenging was entrusted to 13 decrepit old men, who took 90 days to complete a single round. In the more crowded districts of the city, typhus and other fevers were constantly present. The death rate was 23.38 per thousand. The long battle against "vested rights in filth and dirt," which began in 1855, reduced this in 50 years to 17.1, with a further decrease during the present century.[7]

The germs of typhoid fever and cholera are spread

[7] Henry Jephson, *Sanitary Evolution of London*, 1907; Havelock Ellis, *Problem of Race Regeneration*, 1911.

largely through the use of water that has been polluted by sewage. The problem is being attacked at both ends. Sewage can be practically freed from bacterial life, either by chemical treatment, or by the use of septic tanks or slow filtration, permitting the growth of other types of bacteria. These either destroy the harmful forms or so delay their passage as to give them time to die out. The same methods are used in the purification of the water supply. In Albany, N. Y., where a filtration plan was installed in 1899, the average annual death rate from typhoid was reduced from 104 to 28 per 100,000, or 73%. In Hamburg, Germany, where the water supply was taken directly from the Elbe, a cholera epidemic in 1892 brought 17,000 cases and 8,600 deaths. The neighboring city of Altona, which used the same water, after additional contamination from Hamburg sewage, had only a few sporadic cases of the disease, owing to the efficiency of its sand filter system. Hamburg promptly installed a water filtration plant, reducing its annual death rate from typhoid by 85%. And the saving of one death from typhoid fever, through the use of better water, probably means the saving of two to three deaths from other causes.[8]

But pure water was only a beginning. The increasing care in handling milk and other food products, owing to the growth of knowledge and public sentiment, is reducing another fertile source of disease transmission.[9] There are no dangerous bacteria in milk from healthy cows which have been properly cared for. Pasteurization, if done according to approved methods, is an additional protection, and has no injurious effect on the quality of the milk. The city of Rochester, N. Y., by the establishment of

[8] Marshall's *Microbiology*, 1917, 254-288; C. V. Chapin, *Sources and Modes of Infection*, 2nd ed., 1912; Wm. T. Sedgwick, *Prin's of Sanitary Science and the Public Health*, 4th ed., 1914; H. W. Hill, *The New Public Health*, 1916.

[9] Marshall's *Microbiology*, 1917; M. J. Rosenau, *The Milk Question*, 1912; John C. Olsen, *Pure Foods*, 1911.

municipal milk stations, reduced nearly one-half the deaths of children under five years old.

Probably 600,000 people in the United States still die every year from preventable diseases. But the advance in sanitary and medical science is beginning to tell in the census figures. In the U. S. Registration Area, between 1900 and 1917, the deaths from typhoid were reduced from 35.9 to 13.4 per 100,000; diphtheria from 43.3 to 16.5; tuberculosis from 201.9 to 146.4; infant diarrhea from 108.8 to 64. If we are living in a city of 100,000 people, 150 individuals are alive today who, under quite recent conditions would have died last year from these four causes alone.

The most notable advance has been in infant mortality, that is of potential men and women dying in the first year of their life. As some one has said, babies do not die, they are killed. In 1910, about 127 out of every thousand born were deprived of the chance to live and develop. For some foreign countries the figures were still higher, although a marked decrease was everywhere registered over a period 25 years earlier. In 1917, the U. S. Registration Area showed a mortality rate of 94, or 33 more babies saved out of every thousand. On April 6, 1918, a Children's Year was inaugurated, partly as a war measure, one of the objectives being to save the lives of 100,000 babies. The results cannot be given in statistics. But "millions of adults in this country have learned through the Weighing and Measuring tests alone that weight in relation to height and age gives a rough index of normal development; that hundreds of thousands of children are undernourished and suffering from other defects which are preventable or remediable; that child welfare is, in short, an important national problem."[10] Through the Red Cross and other agencies, public health nurses are being placed in cities and rural counties, as fast as trained workers can be secured.

[10] Chief, Children's Bureau, *Seventh An. Report*, 1919, 10.

For the unsanitary conditions described, and the suffering, weakness and high mortality resulting, Man not God must be held responsible. And the remedies have been due to the coöperation of Man with God, along the lines suggested in previous chapters. It is a human prerogative and duty to learn the laws of the Universe relating to health and safety, and the control of its forces, physical and organic, in the direction of a better environment. But this work has been carried still further. Much is being done toward the complete elimination of hostile bacteria. No side of Man's control of Providence is more instructive and inspiring.

Smallpox has been wiped out of Germany, by the thorough use of vaccination. Only ignorance or prejudice prevents us from wiping it from the earth. The battle against Tuberculosis, though set back by the War, may be won by the gradual education of the people, and the discovery and isolation of all persons who act as carriers of the tubercle bacillus. It will be a long and expensive contest, but we have learned the strategy by which it must be fought.[11] Malaria, one of the most disabling of man's diseases, is being eliminated by immunizing with quinine, by screening windows, and by destroying the breeding places of its carrier, the *anopheles* mosquito. In Hamburg, Arkansas, the number of cases of malaria, as registered by physicians' calls, was reduced from 2,312 in 1916 to 59 in 1918. The cost of the campaign per capita was $1.45 in 1917, and the following year only 44 cents. Previously the town's annual doctors' bills had been eight times the cost of protection in 1918. This does not take account of the heavy financial loss due to the disease itself. In other words, it was cheaper to get rid of malaria than to have it.[12]

I select another example from the world-wide activities

[11] See S. A. Knopf, *Tuberculosis a Preventable and Curable Disease*, 1909.

[12] Rockefeller Foundation, *Annual Report*, 1918, 31, 188 *ff.*

of the Rockefeller Foundation. Yellow Fever has been driven from a number of its centers of infection, with the prospect that it will in the near future be eliminated from the earth. Attention in 1918 and 1919 was directed to Central America. A commission sent to make a special study of the disease, succeeded in isolating the yellow fever organism, which hitherto had baffled biologists. An epidemic raging in Guatemala led to the assignment of Dr. Joseph H. White, of the Army Medical Service, to work in coöperation with the Guatemalan government. The routes of infection were traced, rigid quarantines enforced, and active measures taken to destroy the sources of infection. In less than six months time, Dr. White was able to report that no yellow fever remained in Guatemala. Equally striking results were achieved at Guayaquil, Ecuador, which has been known as the pest hole of the Pacific. The swampy situation of the town and the utter lack of sanitation made it a seed-bed, not only for yellow fever, but for cholera, smallpox and bubonic plague. The work begun in 1916 by General Gorgas, was resumed after the War. The same methods were followed that had proved so successful in Cuba and Panama. A campaign of education enlisted the support of all classes of the people. Modern water and sewerage systems were installed. The streets were paved, and kept clean of refuse. Houses were screened, and a thorough campaign undertaken to destroy the breeding places of the *stegomyia* mosquito, which acts as carrier of the disease. No yellow fever appeared in the summer of 1919, and Dr. Gorgas considered that the sanitary work already completed was sufficient to prevent reinfection. Human science and enterprise have transformed Guayaquil from a plague spot into one of the safest cities on the coast.[13] Work was continued in other regions, and by the middle of November, 1919, "yellow fever had been practically banished from Central America."[14]

[13] *Id.*, 83 *ff; Outlook*, Nov. 26, 1919.
[14] *Annual Report*, 1919, 19.

Another aspect of Providence, the responsibility for social conditions, may be illustrated by Man's relation to Prostitution and Intemperance. To hold God responsible for the harlot or the drunkard would be to misread the facts of the world. As Flexner puts it: "Prostitution is a modifiable phenomenon. . . . According as society prefers, there may be more or less of it." The attempts at regulation, through the licensing and medical examination of professional prostitutes, proved an utter failure, and have been abandoned in practically all European countries. Medical men now realize that masculine immorality is neither necessary nor wholesome. Experience shows that exploitation and artificial stimulation of the traffic can be checked by proper laws, and able and conscientious officials. Ample governmental provisions may be made for the treatment and cure of sexual diseases, as in Norway and Denmark. From this point, the problem becomes part of the general problem of social betterment, and the raising of community standards.[15] We are beginning to have, as Jane Addams says, a new conscience toward an ancient evil. During the War, notable work was done by the American government and coöperating agencies, not only among the soldiers, but in war-camp communities and munition centers. Among the methods followed were a campaign of education; personal work with individuals, especially young girls; provision for occupation and amusement; strict regulations and penalties; the prohibition of liquor; and medical treatment.

Remarkable progress has been made in recent years in the battle against Alcoholism, with the physical, moral and economic losses that have come in its train. In America, the organized sentiment of the Church on this question has been reinforced by a number of powerful influences. Among these we may enumerate the growing realization

[15] Abraham Flexner, *The Regulation of Prostitution in Europe*, Am. Social Hygiene Ass'n, 1914; Jane Addams, *A New Conscience and an Ancient Evil*, 1912.

of the economic factor, the stand taken against alcohol by the medical profession, the apparently hopeless corruption of the liquor traffic, the failure of all attempts at regulation, and the success of total prohibition as tried out by various states and cities. As Dr. Mayo says, prohibition has been made possible by the supply of potable water now almost universally available. The movement culminated in the outlawing of the manufacture and sale of liquor in the United States, in the interest of national efficiency. Adopted as a war measure, the policy was made permanent in 1919 by constitutional amendment. Figures coming to hand from all sections of the country indicate a marked reduction in crime, the practical elimination of the city tramp, and an increase in savings. The reduced population in public institutions, estimated in Massachusetts alone as saving four million dollars annually, will more than pay the cost of enforcement. Labor disturbances have been singularly free from violence, and the efficiency of labor has been increased, as far as comparisons can be made. Canada is largely on a prohibition basis. Similar movements are under way in various countries of northern Europe. By the International Convention, signed at St. Germain in 1919, liquor is prohibited on the entire African continent, with the exception of Algeria, Tunis, Egypt and the Union of South Africa.

Of Man's responsibility for famine and other disasters, the most striking recent examples are the feeding of Belgium under Mr. Hoover's administration,[16] and the relief work of the American Red Cross during the last half of the War. As one reads the story of the latter in the pages of Mr. Davison,[17] one's growing horror of the destruction and cruelty of man at his worst is overshadowed by the sense of man's power for good, in coöperating for the relief of distress and the betterment of living conditions. And the

[16] See Commission for Relief in Belgium, *Final Report*, 1917; Vernon Kellogg, *Fighting Starvation in Belgium*, 1918.
[17] H. P. Davison, *The American Red Cross*, 1919.

means he uses, or misuses, are the same Divine forces that we have seen him learning to know and control in other fields. Man's capacity for shaping Providence appears to be limited only by his ability to understand and work with the Universe.

PART III.

THE MORALITY OF THE UNIVERSE.

PART III.

THE MORALITY OF THE UNIVERSE.

Section. 1. Individual Relations.

XIII.

THE PLACE OF ALTRUISM.

Our study of Providence has done more than confirm the democratic character of the Universe, the fact that Man and God have entered into contract for the betterment of the world. It has suggested that there may be some definite connection between the success of such altruistic movements by man, the party of the first part, and the character of God, the party of the second part. Are goodness and altruism and social responsibility natural to the Universe? Do they function in a way that may be considered normal, as the Christian hypothesis assumes? Can we say that the Environment to which the scientist, the mechanic, the business man and the statesman are adjusting their lives, reflects the character which Jesus taught by word and by example? This is the final test of Christianity, which will occupy our attention in the remainder of the book.

Our task in the present chapter is to discover and appraise the Altruism that finds a place in human society. I use altruism in the sense in which Jesus applies the term "love" to God and man, as covering primarily the interest in and activity for others, which we find in a social order, as contrasted with self-interest and individual action. Though emotion normally accompanies such ac-

tivity for others, many writers on Christianity have erred in putting the emphasis on feeling. I do not find this view of Christian altruism borne out by Jesus' teaching,[1] and my interpretation is confirmed by the rest of the New Testament, notably Paul's analysis in 1 Corinthians 13.

We have first the altruism within the Family group. By far the greater part of human effort is for others rather than for self. The primary motive in labor is the support of a family. Domestic love gets the world's work done. It is for wife and children that the average hand-worker undergoes long hours of exhausting toil. If he demands more wages, it is that those he loves may have more food to eat, better clothes to wear, more luxuries and pleasures. The same is true of the clerk, the teacher, the business man. How many of us would work year after year simply for work's sake? If we save out of our income, it generally is that our family may be insured against want, or that our children may be given more education and a better start in life. Out of these love-prompted savings is accumulated the world's capital, which turns the wheels of industry. Most young people go to work, either that their parents may be relieved of their support, or because others are dependent on their earnings. The allotment returns of the War Risk Insurance Bureau showed what a large proportion of our young men were contributing to the support of parents or brothers or sisters. When a young fellow falls in love, he begins to save for a home the money he otherwise would spend on himself. The rich man strives for further wealth, largely that he may have more to leave to his children. Riches may not be good for his children, any more than a sudden access of luxury to the laborer's children. But the motive in each case is altruistic. What appears to be selfish striving, turns out to be selfishness for the sake of others. The childless home is a home that has lost its economic motive. The instinct of acquisition has ceased to have any biological value.

[1] *Cf.* later p. 149.

If the man makes a home possible, the woman makes it real. The work of the wife and mother is essentially altruistic. From the day of her marriage, she lives for her husband and his needs. For love of other lives that are to be, she endures the burden and pain of child-bearing. She gives herself to her children during the years of helpless infancy, and the equally exacting years of childhood. She nurses them in sickness. She starves herself if need be, that they may have food. She lives in their lives, and believes in them though they were "hanged on the highest hill." Many women, like many men, are unworthy of marriage. The spread of luxury has doubtless proved an undermining influence in the home. But the fact that 10% of American marriages end in divorce, only serves to bring out in sharper contrast the 90% which do not.

This labor for those they love brings direct returns to the individuals. What a man gives up for the sake of a home, he receives back in love, in comfort, in new interests, in the gratification of more unselfish ambitions. A mother finds her life by losing it. The responsibilities of a home teach steadiness, frugality, patience, self-sacrifice. By no conceivable change in human nature could free love or marital communism or polygamy ever produce as efficient members of the social order. Our Western civilization has been built up on the idealism of the monogamous family.

I pass to the altruism of wider groups, involving other centripetal instincts. The Church is essentially an altruistic enterprise. The compulsion to membership is social. The individual seeks salvation through the group. Or he finds in the church organization a channel for the expression of his altruistic feelings, and an outlet for his benevolence, a means for realizing a better social order. He feels the inspiration of common ideals. And because of this, he gives time and money to the church. In return for such effort for others, he receives dividends in inward satisfaction, in the training of character, in the improve-

ment of social conditions, in the fraternal solidarity of the membership, in the knowledge that his fellow members will stand behind him in case of need. The hold of this altruistic movement on American life is shown by the fact that nearly 45 million persons are directly affiliated with it. They have been contributing annually over 328 million dollars for its support, and probably an equal amount to its work for those outside the membership. Freed from any entangling alliance with the State, the Church in America has been second only to the Family as a force for making efficient and dependable men and women. The return to Jesus' teaching, in its emphasis on social service as well as individual salvation, is giving it a new position of leadership in industrial and national relations.

Fraternal organizations have taken a strong hold on the people of our country. The merely social orders, like the Masons and Odd Fellows, number nearly 19 million members. This does not include the college and school fraternities, or societies among the Negroes. In the typical lodge, the sense of mutual obligation is strongly cultivated. A member recognizes the brothers of his order by badges, grips and signs, and is expected to render them practical support and aid. He can count on such assistance in return. In time of sickness, his comrades visit him and minister to his comfort. In 1869 the Ancient Order of United Workmen added the insurance feature. The various benefit orders, of which 200 are listed in the *Fraternal Monitor* for 1920, number 123,431 lodges and 9,218,101 members. The habit of joining lodges has led to considerable overlapping. The total insurance in force is over 10 billion dollars, and $3,263,800,928 has been paid by the various societies in death or sickness benefits since their organization. The advantage to the individual from this type of altruism, is obvious. Whether in sympathetic aid or in insurance protection, he receives *quid pro quo.*

As our next example I take the Labor Union. In modern Industry the isolated worker, unless commanding special-

ized skill, has been at a serious disadvantage. From this fact has grown the organized labor movement, which includes nearly five million men, or a third of those engaged in manufacturing, transportation and mechanical labor, besides a considerable number of women. Over 4 million are affiliated with the American Federation of Labor. The expressed aim of this organization has been to secure, through collective bargaining, a fair share in the partnership between labor and capital. Although the advantage of solidarity would appear to be self-evident, it has not been won without a hard struggle with human nature. The instinct of immediate self-interest (or family interest) is so strong, especially in a time of labor surplus, that it requires a strong sense of altruism for the worker to seek advantage through the group, rather than by securing and holding the best job he can obtain alone. This sense of common interest has been learned only through experience. One of the most instructive instances is the history of the men's garment trades, largely carried on by Jewish immigrants from Russia and Austria. The work was done in sweat-shops, under the most unsanitary conditions. Workers were underpaid and subjected to a great deal of petty tyranny. In 1888, under the leadership of the Socialist intellectuals in New York, an organization was formed of the United Hebrew Trades, and 15,000 Jewish tailors won a strike for better conditions. Lack of experience and education, and the constant influx of new immigrants from various countries of Europe, made it difficult to consolidate the advances. The organization of workers was likely to fall apart as soon as their fight was won. In 1910 the men's clothing workers were able to muster 100,000 for a general strike. In 1915 the Amalgamated Clothing Workers of America, a secession from the American Federation of Labor, won its strike in New York. Although the bitter struggle in Chicago was lost, it led four years later to the partnership agreement in the clothing industry, signed between the employers

and the workers, now practically 100 per cent organized. The sweat-shop has practically disappeared. From being the most oppressed and degraded, the men's garment workers have become perhaps the best paid of any semi-skilled labor group, and under the best working conditions. The educational work required to weld the trade into a united body, working and often sacrificing heavily for common ends, will be seen from the fact that the official papers of the Amalgamated Clothing Workers are published in English, Yiddish, Italian, Polish, Bohemian and Lithuanian.[2]

The altruism of the labor movement has a wider aspect. The growing group consciousness of hand workers as a whole finds frequent expression in the moral and financial support given by one union organization to another, and in sympathetic strikes. Some of the latter may have been quixotic and ill-judged. But it is certainly a remarkable example of altruism when a body of workers gives a part of their earnings, and even surrenders their jobs without any assurance of regaining them, in order to aid the struggle of another body of workers, perhaps in a different trade or hundreds of miles away. This sense of class solidarity in the workers of today, the widespread passion for justice, democracy and brotherhood, as far as these affect their group, might almost be termed a religion. It is idealism of the highest order, the struggle for others rather than merely for self. But whatever advantage was gained by the sympathetic strike, was in the end reciprocal. If you helped the man of another trade in his battle, he would be likely to help you in your battle. An advance in one field of labor made it easier to secure advances all along the line. In a later chapter it may be necessary to appraise the labor union movement from the standpoint of society as a whole. I am merely describing it here in relation to the individual trade unionist, as an example of the change from individual to group action, or as we might put it, from family to social altruism.

[2] A more detailed study of this movement will be found on p. 224.

Patriotism is the broadest of the altruistic interests which we shall consider. In normal times it is little in evidence. Except for spasms of community betterment, and the passions and enthusiasms called out by recurring elections, the average citizen appears satisfied to go about his business or his pleasure, leaving the politicians to run the government. It is the same the world over. A few years ago, one wondered whether the progress of civilization had destroyed the idealism, the devotion and courage of the race. But those who looked deeper, realized that this apathy to higher interests was in appearance only. The things men are ready to die for are the things they really value. Some may risk their lives in pleasure. They enjoy the thrill of excitement and danger in automobile racing or aviation feats. But no one would go into an aeroplane trial if he knew he would be killed. Men risk their lives in business: to secure big wages, to reap large dividends. But you could not hire a man to kill himself. If I may use the paradox, people all over the world were living for the things men will not die for.

But suddenly their nations became involved in war, in what they believed was a necessary and righteous struggle. And there was revealed to us the idealism that is latent in ordinary men and women, the love of country which it needs only a great crisis to call forth. Never has there been a war with so few cowards or so few laggards. Never before, in the world's long history, have so many offered their lives for an ideal. Of the work of the American soldier I need not speak. Only the sudden ending of the war prevented him from matching in quantity as he did in quality the sacrifice of England and her colonies, of Belgium, of France and Italy, of Russia and Serbia and Roumania. Modern wars are wars of peoples, not of armies alone. In my work with the home organization of the Red Cross, I had occasion to become intimately acquainted with half the counties of one state. On my mind is left an indelible composite picture of the American com-

munity. The universal and largely spontaneous organization for public service. Leading business men giving up their business, often for months at a time, to devote themselves to patriotic enterprises. The repeated drives for money, and the unvarying enthusiasm of the response. Women knitting everywhere. The work room with its humming sewing machines, and the piles of completed socks and hospital garments. The white-robed workers on surgical dressings, folding in mystic silence the endless yards of gauze. Food conservation, each household correcting its habits of waste, and cheerfully altering its diet, that the soldiers and workmen of the Allies might be fed. Even the children sewing, and gathering salvage, and planting war gardens, and saving their money for thrift stamps, and stinting themselves on sugar. The organized neighborliness of the Red Cross home service, caring for the soldiers' families in every need. The canteens at the railway junctions, serving coffee and sandwiches to trainloads of men in khaki, at any hour of the day or night. For two years the average American community was on an altruistic basis, finding its joy in the service of a common cause rather than in the service of self.

The real point in this familiar picture which is framed in our memories, is the fact that social altruism, the cooperation of the individual in the national cause, was an advantage to the individual. The American nation entered the War, because it had suddenly and rather tardily become convinced that its own safety and the perpetuation of its institutions was at stake. And the military victory, which secured these vital ends, was made possible by the patriotism and team work of the people at home. What upset Germany's calculations, and sent an irresistible stream of men and supplies across the Atlantic, was the public support of our government. This was registered in the adoption and smooth working of the selective draft, the saving of concentrated foods, the increased production on American farms, the supplies made by the women, the

mobilization for shipbuilding and munition making. Loyalty and coöperation brought the result for which the individual was striving, and on which his well-being depended. The tide of idealism ebbed rapidly after the War. But there can be no question that a similar crisis would bring the same popular response. And the patriotism of the citizen in critical periods is an index of the advantage he finds in the normal operations of his government. Men coöperate as a nation because they realize that it pays to coöperate. The feeling of bitterness toward the revolutionist is an instinct of self-preservation.

This list of altruistic enterprises is not intended to be exhaustive. I have merely selected, from a single country, the more prominent examples of a certain type, which illustrate the principle of a direct return to the individual from the altruism which he shows within the organization. It is evident that sympathy and coöperation rank with, and perhaps surpass, selfishness, as motives in the everyday life of man.

Both Biology and Sociology bear witness to the same fact. We have begun to recover from the one-sided emphasis on the struggle for existence. Such conscious struggle as we find in the lower organisms is largely for the sake of offspring; it is sacrificial rather than self-assertive. In general the strongest animal groups are those which have developed the instincts of mutual aid, and to some extent of affection and sympathy. Coöperating animals were able to secure a better food supply and better protection. We see this in the ants and bees, in migratory birds, in the ungulates, rodents, and ruminants. The only notable exceptions among the Mammals are some species of carnivora, which were strong enough to live without mutual protection. Association tended to develop intelligence. The higher apes are exceedingly gregarious; they hunt and fight together, communicating by rude sounds. The current view is that man's most distinctive feature, a developed speech mechanism, grew out of the social habits

of his immediate ancestors. Modern studies in Anthropology indicate that the earliest human races lived in groups of considerable size, that is in societies rather than in isolated families. Coöperation and loyalty, which were purely instinctive in the lower animals, were taught to the human child along with other accumulated experiences of the clan. But the instincts were there, as part of the child's inherited brain mechanism. All that was necessary was to reinforce them and direct their expression.

Idealism is not an exotic in human life. The practice of altruism is necessary if an organized body of men is to survive. Within any social group, sympathy and mutual aid are a normal condition; selfish individualism is abnormal.

XIV.

THE HIGHER SELFISHNESS.

The social phenomenon we have been describing, which might be termed group altruism, brings an evident advantage to the individual members of the group. All social and political organization is based on this fact. It pays the individual to consider the interest of the other members of the group. Jesus broadens the principle to cover society as a whole. He expands the group into a world. The obligations of a churchman to his fellow members should be extended to the entire community, Samaritan and Gentile as well as Jew. The strength of family, fraternity, guild or nation, shows the possibilities in a brotherhood that will include men of every race and class. Jesus enjoins such consideration for the interest of all other persons without distinction, as we give to our own interest or that of our group, and predicts the same reflex advantage. The Universe is arranged on that plan. Such an attitude is a condition of successful adjustment.

Is this true? Does the Christian theory work in actual practice? A first superficial view of the field gives a negative answer. The selfish and vicious man often succeeds in business, where, apparently with equal ability and opportunity, the just and considerate man fails, when he strives for a common objective. The same is true of the selfish corporation or nation. This fact has puzzled both Jewish and Christian thought, and led many to assume that moral retribution must be evened up in the future life. The later readjustment of rewards may prove to be a fact. But to rest on such an assumption is to deny the essentially

moral character of the present world. This is also true if we fall back on the statement that the considerate and righteous man gains more real satisfaction out of life. Inward joy may be a better criterion of success than material prosperity; many deliberately turn their back on the latter in order to retain the former. But if the good men have all the joy, while the bad men have all the prosperity, we can hardly call the world Christian. Under those conditions, the great majority of people, at least in our Western civilization, would go after the prosperity. Jesus teaches no bargain counter ethics. But his theory demands that, in the long run, the good man should not only have more satisfaction, but that he also shall be more successful in earning a living, in doing the work of the world, in striving for those natural and legitimate rewards which offer themselves in human society.

Our previous discussion should give us a better perspective in viewing man's adjustment to the Universe. Such an adjustment we have seen to be many-sided. The moral phase which we are now considering is only the concluding chapter of the story. Practical success may be due to a more religious attitude, a closer communion and co-operation with God, along some special line of human activity. It may represent a more complete adjustment in physical labor, in the knowledge of plants and animals, or in the field of health or of mental activity. If God is present and active in all the extra-human Universe, religion is as broad as life itself. In running a lathe, religion consists in getting the most out of the material. In farming it is shown in the care taken of one's cows or fruit trees. The bad man who succeeds may be found to have more physical stamina. Or he has been in closer communion with God in the mental field. He has applied himself more faithfully, made better use of his mental resources, followed more successfully the psychological laws that lie at the root of business. The same may be true of the officers and soldiers of an army. From a moral

point of view, the German armies at the beginning of the War were behaving very badly. And yet they won victories, because they had complied with the other conditions which make for success. Complete adjustment in any line is bound to bring results. The Universe plays fair.

The question before us therefore should be put in this form. Granting not only equal ability and opportunity, but equal health and equal mental responsiveness, and compliance with the conditions that make for success in the non-moral field, do consideration and character prove an advantage? Do they appear in the Universe as business assets? Does the Christian theory as to the character of God and the consequent obligations of a man to his fellow men, produce more efficient members of the social order? In this and the following chapters we consider the individual, taking up later the economic system and the life of nations.

The practical value of consideration and courtesy has been discovered by many people. As a general rule of life, it will approve itself to any one who cares to put it to the test. I have only to watch my own nursery to see a caricature of the doctrine that you gain what you fight for. Perhaps the child does get the plaything he fights for. But he loses more than he gains. He cuts himself off from other playthings and common games which a more generous attitude would have secured. Jesus was right in saying that in our treatment of others, in the ordinary intercourse of life, we reap what we sow.

A single example will suffice. James Freeman Clarke has left a description of a stage-coach journey from Boston to Kentucky, in 1833. Their route lay through the Cattaraugus woods, where the mud and rough corduroy made travelling extremely uncomfortable. There was every temptation to be cross. One man, however, so enlivened the company and was so good-natured and accommodating, that the other occupants of the stage-coach took the same tone. Instead of a disagreeable journey, they

felt, as he says, as if they were having a pleasant picnic. Mr. Clarke, being a man of sense, adopted this as a method of heightening his own enjoyment on the rest of the trip. As soon as they took their places in the coach, he would show an interest in the other passengers and their comfort. If they preferred his seat to their own, he would offer to change places. Such attentions had the desired result. He found that his companions would almost always follow his lead, and take pains to be polite and accommodating.[1]

So great is the value of consideration, from a selfish standpoint, that it has actually been capitalized by modern business men. Until the last half of the 19th century, retail trade in the United States was on the basis of catch-who-catch-can, as is still the case in many of the smaller towns of Europe, and everywhere in the Orient. The store-keeper looked on the customer as his victim. Stores were dark and prices were not plainly marked. The salesman charged the highest prices the customer would pay. If a poorer quality of goods could be substituted, it was considered legitimate to do so. To escape from a store without buying was a difficult matter, and might subject one to considerable rudeness. When John Wanamaker, in 1861, introduced into Oak Hall in Philadelphia the idea of "but one price and that plainly marked," it meant the beginning of a revolution in the attitude of a store-keeper toward the public. Courtesy was required of all employees. Ten years later, on opening the great store at Tenth and Market streets, he announced that any purchasers who were not satisfied with their goods could have their money refunded. People were invited to come to the store even if they had no intention of buying. Special efforts were made for their comfort. The store was to be considered, not merely as a shopping center, but as a place to rest or to meet one's friends. To the older business men in Philadelphia, such methods seemed suicidal. They under-

[1] E. E. Hale, *James Freeman Clarke*, 1891, 59.

mined what had always been considered the foundation principle of retail trade. But the doctrine of consideration for others proved so much more successful than the doctrine of selfishness, that stores all over the country were obliged to revolutionize their methods. "Modern storekeeping is no longer a horse-trading business or a peddler's dickering. It is a serious business, cleanly and honestly conducted. It is finding a market for and distributing the world's merchandise." [2]

The past twenty years have confirmed the statement given by Wanamaker himself as to the relation between seller and buyer which lies at the foundation of modern business evolution. The growth of retail business has been based solely on public service. The ambition of the modern retailer is to give the best merchandise at the least cost. While he cannot control the cost of production, he can modify the cost of distribution and his own margin of profit. His working principle is the minimum of profit that will create the maximum of business. Any combination between rival firms would raise prices, diminish sales, and reduce the net return to the store-keeper. Such control of the retail trade as is attainable, rests entirely on superior service and lower prices. Popularity, founded upon actual worth, is its sole power to command.[3]

That the same attitude toward the public is being adopted by large corporations is seen from the statement by Judge Gary for the United States Steel Corporation: "There is developing and becoming fixed in our companies at least, all along the line, a determination to conduct affairs in such a way that we will not cause injury to anybody, and, on the contrary, that we will benefit everybody affected by us; and that includes fair and decent and honest treatment of our employees, our stockholders, our competitors in business, our customers, and the general public, because we believe it is not only good policy from

[2] *Golden Book of the Wanamaker Stores*, 1911, 180.
[3] *Evol. of Mercantile Business*, Am. Acad. of Pol. Sci., 1900, part 3.

the standpoint of pecuniary success, but because we believe it is right." [4] One item of this program, that relating to the employees, one might wish to refer to the Interchurch World Movement. But how distant and barbaric sounds the statement of corporation policy from the last generation: "The public be damned!" On the peaceful dissolution of the meat-packing combination, in the same year, the statement was made by the packers that heretofore they had conducted their business upon the basis of economics and legality, but that now they had taken account of the goodwill of the public.[5]

Is consideration for others really self-interest? This undoubtedly is the view taken by Jesus. He considers himself to be formulating a law of human society. The selfish man is the unsocial and abnormal man. Recognition of common interest in all our relations means the socializing of the individual. It completes the process already begun within the group. Because of the mutuality of interest in any community, because the goodwill of those with whom we are dealing is such a valuable asset, it is to a man's advantage to promote the interest of others.

The question might be raised, whether one can show goodwill without first feeling it as a motive. I must leave the solution of this problem to the psychological analyst with his questionnaires. My own impression is that the two things go together. In most cases the feeling of goodwill comes first. The practice of consideration by American and European storekeepers is due to what Kidd calls the "fund of altruistic feeling" generated by Christianity, of which I shall speak in a moment. On the other hand it is possible for a man to adopt the policy of consideration for purely selfish reasons. But in this case the practical consideration of others' interests invariably tends to generate the spirit of goodwill in the man who adopts such a policy. He has put himself in line with a higher

[4] *Outlook*, Aug. 23, 1914.
[5] *N. Y. Times*, Dec. 18, 1919.

law, a law of the Universe that is written into the very structure of human society. Action in accordance with that law brings a definite moral reaction. The acceptance of brotherhood for practical reasons, releases Divine forces making for brotherhood.

The value of Jesus as an ethical teacher is that he takes human nature as he finds it. He deals with actual rather than ideal conditions. There has been a somewhat general impression that his "Kingdom" is a Utopia, requiring perfect men, actuated by purely altruistic motives. I cannot find evidence for this in his teaching. However desirable the feeling of goodwill and fraternity, it is something that must be caught rather than commanded. Selfishness of the narrow sort ought to be exorcised. But meanwhile it can be held in abeyance, or turned to practical account. Self-assertion and acquisitiveness, when properly disciplined, are of immense social value. The "love" emphasized by Jesus, according to our Greek translation of his teachings, is a word meaning admiration or esteem, rather than the commoner word for emotion. We are not bidden to feel affection for the patron of our store, for our competitor, or for our enemy, but to esteem him, to do him good, to admit him into the group where we recognize common and mutual interests. This is a rule that any one may apply. A single individual can begin to build around himself a kingdom of goodwill. Christian ethics are on an experimental basis. The real proof of Christianity is the fact that it works.

One of the fundamental tests of any theory involving human relations is the pragmatic one of its effect on the individual. A view of the Universe which makes men more social and efficient, will tend to prove that such a view conforms to actual working conditions. The principle of common interest has won slow and as yet only partial recognition. In a ready-made or mechanical Universe, this fact would militate against its altruistic character. Thus Le Dantec scoffs at social habits of mind as

"mental deformations," because of their late development, and the fact that they have not been able to modify very deeply the primitive selfish nature of man.[6] But social habits of mind are acquired characters. And the best scientific evidence is that acquired characters are not inherited. Apart from civilized training, man is today what he always has been, a savage animal. At the same time the human species is essentially gregarious. In the social history of the race, as we showed at the end of the last chapter, the selfish man is the unsocialized and incomplete man. Just as the child is born selfish and gradually learns to live in a society. It is not a question of acquiring new instincts, but of bringing certain centrifugal instincts into subordination to centripetal ones. The fact brought out in the present chapter, that man becomes more efficient as he grows more altruistic, shows that he is becoming more completely adjusted to the Universe. What is abnormal on Le Dantec's theory, becomes normal on Jesus' theory. The slow acquirement of social as contrasted with group altruism, is exactly what we should expect in a Universe which requires for its completion the help of many generations of men. The character of the Environment to which men are adjusting their lives will show more clearly as the process goes forward. For an analogy we may take the science of electrical engineering. Through our improved machinery for developing and controlling a current, we know vastly more about electricity than could be learned through the rubbing of amber or Franklin's kite. But there is more electrical potential in the physical universe than we are yet able to harness. Our knowledge of social laws and forces is similar. The world is only beginning to realize the possibilities which lie in goodwill.

In the ethical history of the race, the most notable fact is the influence of the Christian idea of God, itself Oriental in origin, on the civilization of the West. Lecky has thus summarized the effect of Christianity in the Roman Em-

[6] Felix le Dantec, *L'egoisme seule base de toute societé*, 1911.

pire: "The high conception that has been formed of the sanctity of human life, the protection of infancy, the elevation and final emancipation of the slave classes, the suppression of barbarous games, the creation of a vast and multifarious organization of charity, and the education of the imagination by the Christian type, constitute together a movement of philanthropy which has never been paralleled or approached in the Pagan world." [7]

In the world today the same contrast may be noted between the sympathy for others in Christian lands, and the relative callousness of countries untouched by Christianity. It is not necessary to give in detail the various philanthropic activities found in our Western civilization. Care for the orphan, the blind, the insane, the poor, at first a matter of private charity alone, has become a common responsibility and a recognized function of the State. Pity for the needy, help for the man who is down, has come to be almost second nature with us. So strongly has consideration for human need become embodied in modern charity, that it is almost inconceivable that a stranger fallen among thieves and left stripped and wounded, should be passed by on the other side. Where at the beginning of the Christian era men drew the doctrine of human brotherhood from the character of God, as revealed by Jesus, today we are beginning to infer the character of God from the fact of brotherhood.[8]

Another important aspect of the growth of social altruism is the movement toward Democracy.[9] The emancipa-

[7] W. E. H. Lecky, *Hist. of Eur. Morals*, 1869, II, 107.

[8] Jn. E. le Bosquet, *The Modern Man's Religion*, Harvard Theol. Review, 7, 97, 1914.

[9] Suggestive material on this subject will be found in Jas. Bryce, *Modern Democracies*, 1920; Wm. R. Thayer, *Democracy: Discipline: Peace*, 1919; Arthur T. Hadley, *The Moral Basis of Democracy*, 1919; John R. Commons, *Races and Immigrants*, 1907, chap. 1, *Race and Democracy;* Walter E. Weyl, *The New Democracy*, 1912; Walter Lippmann, *Drift and Mastery*, 1914; Herbert Croly, *Progressive Democracy*, 1914; Graham Wallas, *The Great Society*, 1914; Harold J. Laski, *Democracy at the Crossroads*, Yale Review, 9, 788, July, 1920.

tion and self-assertion of subject classes has been accompanied by the increasing readiness of men to trust each other. Thus the democracy of small homogeneous groups, like the English town and county, or the city guild, has been extended to cover the relations of many groups within a larger unit. Local self-government grows into the democratic colony or state. Politically, this has meant the extension of the franchise, the growth of the representative principle, and the recognized power of the people, by majority vote, to manage and change their government. Socially, it shows itself in universal education, and the demand for equality of opportunity. The industrial phase, which will be considered in a later section, is the demand for some measure of control by groups of workers over the industry in which they are engaged. Democracy, in any of these aspects, is a movement rather than a fixed state, and hence not easy to define. We may regard it as a point of view: the habit of looking at all social questions from the standpoint of Society as a whole, rather than of some limited but powerful class. It is an ideal of human relationships, which would recognize the inherent capabilities of manhood, and the duty of mutual trust, support and esteem.

XV.

CHARACTER AS AN ASSET.

Jesus' system of Ethics is surprisingly simple. He does not, like other ethical teachers, base moral obligation on tradition or authority, on an innate sense of right or wrong, or on some abstract principle. His treatment is essentially biological, a statement of man's necessary relation to his Environment. Christ assumes that we are living in the closest possible relations with a righteous and loving God, and that we are coöperating with Him and with our fellow men in an unfolding social order. From human life as we know it, he draws certain general laws of conduct that will fit this assumption.

To state this position a little more fully, the individual man is a biological unit. He is not self-existent or self-sufficient. He cannot live in isolation. It is necessary for him to adjust his life to other human units, and to the Universe itself. If the Universe reflects a moral and altruistic God, the same qualities are required both for a complete development of the individual man, and for normal social relations. Man is not bidden to be righteous and considerate because God has so commanded, but because a full adjustment of man to his Environment cannot be secured on any other basis. The laws of Ethics are like the laws of Mechanics, or the laws of Agriculture, or the laws of Health or Providence. They represent the necessary coöperation between Man and God in a personal and social order.

Our interest in this book is not in expounding Jesus' ethical principles, as outlined in our first chapter, but in

testing the assumption which underlies them. If the relation of man to the Universe is that of a distinct and coöperating unit, as our earlier treatment seems to show,[1] and Jesus has given a correct interpretation of the character of God, we should expect moral coöperation with such a God to release helpful moral forces. In the last chapter we gained a certain confirmation of one part of Jesus' statement. Consideration and goodwill have a practical value, not only within the local group, but in society at large. They function in the way that his theory calls for. Let us now apply the same test to moral integrity. Do honesty and justice, responsibility and self-control, prove of practical value, under the conditions which the Universe lays down?

The value to the individual and to society of that disciplining of primitive instincts which we describe as self-control, is so evident that we need spend little time upon it. We have already noted the growing recognition of intemperance as an economic and social handicap, and the steps taken to check this evil. The social value of sexual purity was suggested in our chapter on the Making of Man.[2] Anger and other violent emotions are detrimental not only to health but to general efficiency, even when they fall short of injury to another's property or person. In our study of industrial and national relations, we shall have occasion to note the danger, from the point of view of Society, of unchecked greed and domination, which are merely the rank growth of the natural instincts of possession and self-assertion.

It has become almost a commonplace in our Western Civilization to demand justice of all persons, in all relations. The sense of injustice is one of the most potent factors in creating friction between employer and employee, and in depreciating the value of the human factor in production. In other words, just dealing, in fact and in appearance,

[1] Chapters 7 to 12.
[2] See *ante*, p. 68.

is an asset in the account of any industrial plant. The importance which Society attaches to just dealings between man and man, lies at the basis of our system of Law. In the words of the Magna Carta: "To no one will we sell, to no one will we refuse or delay, right or justice."

Failure to reach this high ideal must be attributed not to sentiment but to the inadequacy of legal and court machinery. The impossibility of knowing the law in all its changing intricacy, the delays and expense of legal contests, have made it difficult for the poor man to secure justice. Here again has been a fruitful source of social friction. A case is on record where a judgment for ten dollars in favor of a wage-earner was appealed and postponed for a year and nine months, and required the plaintiff to spend eleven days in court, in addition to his attorney's fees. This intolerable situation is being remedied by the establishment of Small Claims Courts, where lawyers are not permitted. In Cleveland, Ohio, the total costs to the plaintiff are 52 cents; in 1915, 5106 cases were tried, and judgments given to an amount of $32,872.14. In a number of American cities, public defenders are appointed to represent the accused, thus eliminating the jail lawyer, and reducing the length of the trials, in Los Angeles from a total of 239 days to 58 days.[3]

I pass to the consideration of a virtue whose survival value may be more open to question, that is Honesty. Any one familiar with business knows that there is a great deal of dishonesty in factory products which cannot be accounted for by faulty inspection. Such a policy is clearly short-sighted. An employee who is encouraged to cheat the firm's customers, is likely to take a similar advantage of the firm. The attempt to pass off shoddy, short weight or careless workmanship, will in the long run react on the seller. An example on a large scale is the

[3] Reginald H. Smith, *Justice and the Poor*, 1919. See also Everett V. Abbot, *Justice and the Modern Law*, 1913.

boycott against goods from a certain country instituted by Australia in 1919, because of the commercial untrustworthiness of the merchants from that country with whom they were dealing. The working of this principle in retail trade was considered in our last chapter. Permanent success requires the building up of a reputation for quality and fair dealing. Pride in the firm's product is an important element in quality production. We have reached a point in Industry where honor in trade is a definite asset, and dishonesty a serious handicap. The man who makes money dishonestly is really trading on the general community standard of honesty and service. Even the advertiser has come to realize that there is a commercial value in telling the truth.

An interesting recognition of this principle is found in the Rotary Club movement, an organization of representative business and professional men in various cities. Its Code of Ethics is as follows:

FIRST—To consider my vocation worthy, and as affording me distinct opportunity to serve society.

SECOND—To improve myself, increase my efficiency and enlarge my service, and by so doing attest my faith in the fundamental principle of Rotary that he profits most who serves best.

THIRD—To realize that I am a business man and ambitious to succeed; but that I am first an ethical man, and wish no success that is not founded on the highest justice and morality.

FOURTH—To hold that the exchange of my goods, my service and my ideas for profit is legitimate and ethical, provided that all parties in the exchange are benefited thereby.

FIFTH—To use my best endeavors to elevate the standards of the vocation in which I am engaged, and so to conduct my affairs that others in my vocation may find it wise, profitable and conducive to happiness to emulate my example.

SIXTH—To conduct my business in such a manner that I may give a perfect service equal to or even better than my

competitor, and when in doubt to give added service beyond the strict measure of debt or obligation.

SEVENTH—To understand that one of the greatest assets of a professional or of a business man is his friends, and that any advantage gained by reason of friendship is eminently ethical and proper.

EIGHTH—To hold that true friends demand nothing of one another, and that any abuse of the confidences of friendship for profit is foreign to the spirit of Rotary, and in violation of its Code of Ethics.

NINTH—To consider no personal success legitimate or ethical which is secured by taking unfair advantage of certain opportunities in the social order that are absolutely denied others, nor will I take advantage of opportunities to achieve material success that others will not take because of the questionable morality involved.

TENTH—To be not more obligated to a Brother Rotarian than I am to every other man in human society; because the genius of Rotary is not in its competition but in its cooperation; for provincialism can never have a place in an institution like Rotary, and Rotarians assert that human rights are not confined to Rotary Clubs but are as deep and as broad as the race itself; and for these high purposes does Rotary exist to educate all men and all institutions.

ELEVENTH—Finally, believing in the universality of the Golden Rule—All things whatsoever ye would that men should do unto you, do ye even so unto them—we contend that Society best holds together when equal opportunity is accorded all men in the natural resources of this planet.

Honesty lies at the foundation of the modern system of Credit. How general today is the assumption of integrity and fair dealing will be realized if we stop to consider the amount of business done on trust, from the grocer who allows a wage-earner to run an account until pay day, to the bank which grants its depositor a loan on only his personal security, or gives hard cash in exchange for commercial paper, perhaps from the other side of the world. The people of the United States, in 1913, exchanged goods

to the amount of $173,000,000,000 by the use of checks.[4]

In the granting of private credit, the primary consideration is the character of the applicant. "A man without wealth or apparent ability to pay may receive credit if it is known that he is honest, that he treats his financial obligations very seriously, that he would be willing to do almost anything than to fail to pay his debts. Such a person may enjoy excellent credit whereas one of considerable wealth but who is slow in making payments, may not have good credit." [5]

This principle finds an interesting application in the Morris Plan banks, originated by Arthur J. Morris, of Norfolk, Virginia, and now found in over a hundred cities. Loans are made on notes endorsed by two other persons, the three parties being accepted simply on the basis of approved honesty and earning capacity. Interest is charged at 6 per cent, the first year's interest being deducted from the loan, and the principal repaid in weekly installments. For a small additional sum the loan is insured against the death of the borrower. There are no depositors, the necessary capital being secured largely through the sale of loan certificates. The losses in ten years' time have been less than one-tenth of one per cent. As a substitute for the loan-shark the plan has proved of inestimable value.

The procedure in mercantile credit is very similar to that in private banking. It pays the business man, just as it pays the private citizen, to be honest. Nothing is guarded more jealously by the progressive merchant than his reputation for honesty and promptness in meeting his obligations, for on this depends his credit rating and the terms he is able to secure. As the losses sustained on credit systems must be charged up to the honest borrowers, a

[4] J. L. Laughlin, *Credit of the Nations*, 1918, 11.
[5] James E. Hagerty, *Mercantile Credit*, 1913, 79. See also Wm. A. Prendergast, *Credit and its Uses*, 1906.

raising of the general level of honesty is to the advantage of society at large.

The credit man takes account of the character of the community. If there have been many dishonest failures in the town, it is evidence of a low moral tone. Public opinion has failed to ostracize the men who have easy standards of business honor. Those living in such a community are either refused credit or charged a higher rate. In other words, it pays to live in an honest town.[6]

American farmers are beginning to follow the lead of Europe and organize coöperative societies, where individual credit is pooled for the benefit of the membership, in order that producers without capital may secure loans at a reasonable rate. Since the membership as a whole is liable for the amount of the loans, the honesty of each member becomes a social responsibility.[7]

Joseph W. Roe, in an address before the Society of Industrial Engineers, Oct. 29, 1919, gave the results of a circular letter sent to a number of leaders in the profession, asking them to state what they considered the most important factors in determining success or failure in engineering. Answers were received from 1500 engineers. Their estimate of the relative importance of qualities was tabulated as follows:

Character	41.0%	
Judgment	17.5	
Efficiency	14.5	
Understanding of men	14.0	87%
Knowledge of fundamentals	7.0	
Technique	6.0	13%
		100%

A second letter, to members of the four Engineering Societies, brought similar results. Out of 7000 replies,

[6] Hagerty, *op. cit.*, 99.

[7] Jas. B. Morman, *Prin's of Rural Credit*, 1915; Henry B. Wolff, *People's Banks*, 3rd ed., 1910.

94.5% put the character group first, and knowledge and technique last. The rating of qualities could be calculated thus:

Character	24.0%	
Judgment	19.5	
Efficiency	16.5	
Understanding of men	15.0	75%
Knowledge of fundamentals	15.0	
Technique	10.0	25%
		100%

If purity, justice, honesty, and all the other elements which make up strength of character, are so important from a social standpoint, our interest shifts to the problem of their attainment. Character does not grow on trees. It does not spring up spontaneously and universally, as the natural evolution of animal instincts, or as the fruitage in human life of a Moral Absolute. It is not inherited. It is not taught, in the sense that reading and arithmetic are taught. Character is an art, which must be learned by the individual through constant practice. It is a spirit that is caught from example. It is an achievement, which grows out of a constant struggle to control our emotions, and direct them into useful channels. It is a sort of social equilibrium which the child must learn, just as he must learn to balance himself in walking.

In the accomplishment of this self-discipline, the three chief means have been Custom, Education and Religion. Community standards, as voiced by public opinion, and registered in law, have been a powerful agency for enforcing moral conformity. This influence has been both passive and active. The moral force of association is very strong. A man naturally tends to do what the group is doing, to hate what the group hates, and admire what the group admires. To feel himself different from his fellows is a heavier cross than the ordinary person can bear. He

makes every effort to earn the reward of praise, rather than incur the penalty of blame. But Society goes very much farther than this. No tribe could exist if, within its membership, murder, robbery and treachery were common. The self-discipline of the individual is a part of the self-preservation of society. To enforce loyalty, respect for life and property, and the other virtues which are necessary for its preservation and strength, the group uses the weapons of fines, physical punishment, death or banishment. The immoral man becomes an outlaw, cut off from the assistance and protection of the tribe. The military state and the industrial nation develop their own codes of ethics, and enforce them by such means as they deem effective.

I use Education in the broad sense, as including the philosophy and literature that help to shape ethical standards, and the influences noted in an earlier chapter which go into the training of children and youth. As civilization advances the school is used to supplement the educational work of the home. Mere knowledge is not sufficient for ethical training. The great advance in general intelligence registered in the past hundred years, has not in itself made the race more moral. Some instruction in ethical principles is possible. Examples of noble character may be held before the children as ideals. But the chief contribution of the school has been along the line of discipline. Educators attach increasing importance to the foundations of character building which may be laid through required work, both mental and manual, habits of regularity, promptness, accuracy and obedience, the spirit of truthfulness and honor, the practice of team-work and self-government, and the expression of patriotism.

But the strongest influence in character building has undoubtedly been Religion. From the dawn of history, the function of religion has been to throw higher sanctions around community standards, and awaken an emotional response. Fear of taboo, the need of ensuring the

coöperation of the tribal god, gave to the regulations of custom a ten-fold strength. The institutional side of religion is essentially conservative. But the great religious teachers have been unconscious revolutionists, helping to mold the ideas that underlie customs and institutions. Jesus, like the Hebrew prophets, represents the Universe as a moral order, whose Thou Shalt and Thou Shalt Not are neglected at our peril. And the peril and benefit are immediate and practical, rather than the fear of future punishment or the hope of paradise. The God of whom Jesus speaks is present, not distant; just, not capricious; an altruistic rather than an autocratic Being, ready to cooperate with man in all his moral struggle. In other words, man's self-discipline is not against Nature, but with Nature. Man is adjusting himself to a moral Environment, a righteous and loving God, whose laws, vaguely recognized in tribal and national standards, the Master restates in simple but definite terms.

It would be hard to overestimate the importance of Jesus' contribution to ethical theory and to character building. It is a fact of observation that Christ's doctrine of God has tended to make men more moral. The idea of Divine love and coöperation has brought out latent qualities, and made self-conquest possible. Natural human emotions, which if left to run wild are dangerous to society, have not been suppressed, but controlled and disciplined.[8] The individual has learned to become temperate, poised, responsible, efficient, considerate, social.

Many examples might be given of this ethical effect of Christianity. Begbie, in his study of the work of the Salvation Army in West London, cites case after case where a degenerate outcast has become a normal and hard-working member of society.[9] Less sensational, but equally valuable, is the change wrought in the period of adolescence, either

[8] *Cf.* Edwin B. Holt, *The Freudian Wish and its Place in Ethics*, 1916.

[9] Harold Begbie, *Twice-Born Men*, 1909.

through conversion or the quieter process of religious education.[10]

I give a single case from the remarkable altruistic movement of Foreign Missions, which aims to raise backward peoples to the level of the highest Christian civilization. The one I have chosen is Mary Slessor's account of seven years' work with the Okoyong of Nigeria, whose fierceness and cruelty had made them the terror of the Calabar region. "We do not attempt to give in numbers those who are nominally Christian. . . . Of results as affecting the condition and conduct of our people generally, it is more easy to speak. Raiding, plundering, the stealing of slaves, have almost entirely ceased. Any person from any place can come now for trade or pleasure, and stay wherever they choose, their persons and property being as safe as at Calabar. For fully a year we have heard of nothing like violence from even the most backward of our people. . . . As their intercourse with the white men increased through trade or otherwise, they found that to submit to his authority did not mean loss of liberty but the opposite, and gradually their objections cleared away, till in 1894 they formally met and bound themselves to some extent by treaty with the Consul. Again, later, our considerate, patient, tactful Governor, Sir Claude Macdonald, met them, and at that interview the last objection was removed, and they promised unconditional surrender of the old laws which were based on unrighteousness and cruelty, and cordial acceptance of the just and, as they called it, 'clean' code which he proffered them in return. Since then he has proclaimed them a free people in every respect among neighboring tribes, and so, placing them on their honour, so to speak, has made out of the roughest material a lot of self-respecting men who conduct their

[10] See Edwin D. Starbuck, *Psychology of Religion*, 1899; Geo. A. Coe, *The Spiritual Life*, 1900; Edward S. Ames, *Psychol. of Relig. Experience*, 1910; Jas. B. Pratt, *Psychol. of Relig. Belief*, 1908; *The Relig. Consciousness*, 1920.

business in a fashion from which Europeans might take lessons. . . . No tribe was formerly so feared because of their utter disregard of human life, but human life is now safe. No chief ever died without the sacrifice of many lives, but this custom has now ceased. . . . With regard to infanticide and twin-murder we can speak hopefully . . . there has dawned on them the fact that life is worth saving, even at the risk of one's own. . . . Drinking, especially among the women, is on the decrease. The old bands of roving women who came to us at first are now only a memory and a name. The women still drink, but it is at home where the husband can keep them in check. . . . They are eager for education. Instead of the apathy and incredulous laugh which the mention of the Word formerly brought, the cry from all parts is for teachers; and there is a disposition to be friendly to any one who will help them toward a higher plane of living."[11]

These results which have come in the lives of men, whenever they have acted on Jesus' assumption of a righteous and coöperating God, tend to confirm this theory of the moral order of the Universe. That the assumption is not merely subjective, is shown by the evidence we have gathered as to the place of character in human society, by the fact that, contrary to Huxley, it has a survival value. Freud's studies in mental pathology have shown the abnormal states resulting both from the suppression of impulse, and from the lack of proper direction and control. To be completely normal is to be virtuous and wise. Taking the Universe as a whole, in its relation to Man, righteousness would appear to have cosmic sanction.

From Jesus' biological standpoint, the deterioration of character under any given conditions, for example in extreme luxury or poverty, in despotism or license, may be taken as some indication of the moral or immoral nature of the conditions, that is of the degree of their conformity to the laws of the Universe. Such deterioration is a warn-

[11] W. P. Livingstone, *Mary Slessor of Calabar*, 7th ed., 1916.

ing that the conditions should be corrected by the individual or by Society.

It seems necessary to take up an objection to the moral character of the Universe which some readers have doubtless raised at various points in our book. I refer to the presence of poisons, fire, storms, harmful bacteria, etc. Though increasingly under man's control, these agencies have not been under such control until the last hundred years, and still do immense and in many cases unescapable damage. I take up the question with reluctance. Not because it is difficult to answer, but because it is hard for me to treat it seriously. One who holds to Jesus' idea of an incomplete and coöperative creation, is accustomed to take the world as he finds it, and work with God to make it safer and more complete. He is inclined to be impatient with any other attitude. Why should we call fire moral when it cooks our food, and immoral when it burns us? Is a volcano righteous when it replenishes our supply of carbon dioxide, and unrighteous when it buries man under its lava flow? Is an albumin good when it takes the form of white of egg, and evil when it appears as serpent's venom? Is it ethical for certain bacteria to serve as a useful food supply for other organisms, and unethical for the same bacteria to generate toxins in human blood? The terms of Ethics are social terms, and have no meaning outside of the field of social relations. Moral laws are the laws of God's behavior in the social order, just as physical laws are the laws of His behavior in the physical order. In either case our business is not to criticize them but to adjust ourselves to them.

To refer to another phase of the question, Mr. H. G. Wells, in one of his books, makes quite a to-do over a cat killing an innocent bird. He thinks that such cruelty reflects on the moral character of the Universe. It all depends on one's point of view. Of course it is possible to use the human analogy, and sentimentalize over the way this scene would appear if the aggressor were a thought-

less or cruel boy. Even in this case the killing of the bird is immoral, not because it is bad for the bird, but because it is bad for the boy. But if Mr. Wells knew cats as well as some of the rest of us do, he would realize that the cat killed the bird in order to eat it, if its meal had not been interrupted. It was trying to replenish its market basket, just as Mr. Wells, by proxy, kills cattle, sheep and poultry. To the biologist, the incident represents the relation between two life environments, that of the felines and that of the birds. To the student of Psychology, it suggests the play of primitive instincts or emotions: on the one hand hunger or predaciousness, on the other fear and self-preservation. The chemist sees in it the physiological changes involved in such nervous processes, or in the dead bird as contrasted with the living bird. What the physicist sees is two series of energy transformations, and the movement of groups of molecules under the stress of natural forces. To the theologian who is at the same time a scientist, the struggle of the cat and the bird is part of God's varied activity in Nature. We may take literally, and with the fuller content Science has given it, the statement of Jesus that "not a sparrow falls to the ground without your Father." The dependableness of natural law, the Divine character of the physical world of which man's body is itself a part, is the background of our picture of the Universe, for which the foreground is the personal and moral relations between man and man, and man and God.

XVI.

THE COÖPERATION OF PRAYER.

If consideration and moral strength are business and social assets, if the evolving Democracy depends for its success on mutual confidence and esteem, the religious attitude which is able to generate these forces has a cosmic value. It must be counted as witnessing to some of the most essential features of the Universe. Jesus' view of the character of God is confirmed. The social value of Christianity finds its natural explanation in the fact that God and the religious man are working in harmony for a common end. Man succeeds in a fuller measure than before, because his living and effort are with the stream of the world rather than against the stream.

The apparent utilitarianism of Jesus' ethics is explained by his emphasis on the underlying moral order of the Universe. "Give and it will be given unto you," "Do as you would be done by," are expressions of a general law. It pays to follow it, just as it pays to follow other scientific laws. But Jesus expects us to follow justice and goodwill, not because it will pay, but because we have learned the character of God our Father, and are adjusting ourselves, whether consciously or unconsciously, to a world of justice and goodwill.

Prayer, on the Christian theory, is the recognition of the necessary coöperation between God and His earthly sons in the making of a social order. In a completed world, there would be no place for prayer. If creation had been worked out to the last detail, if no control or rearrangement of forces were possible, if every event of the

Universe were determined by an unbroken chain of physical causes reaching back to the beginning of Time, the only attitude open to the religious man would be that of submission. He might laud the perfection of the Universe, and kiss the rod which smote him. But to the events and conditions of the world he must bow as to the decrees of an inexorable Fate. He could not expect to alter them by gift or merit of his own, or by any proffered petition. The Universe in which we live is not of that character. We have gathered cumulative evidence for man's power to control natural forces, to create life and shape its conditions. Each day reveals our share in an unfinished but growing creation. We not only bridge rivers and dig canals, sow seeds and develop improved forms of plant and animal life. We also prevent sickness, we train children, we help our fellows in need and in temptation. We change the conditions of the social environment. Christianity merely assumes that what man does, in his daily life, God can do and will do. The same control of natural forces for higher ends which is possible for man, is possible for God, and natural to God.

Prayer cannot involve any arbitrary interference with the laws of Nature. Such an assumption has been widely current, as a corollary of the dualism of God and His world which Jesus sought to overthrow, but which has continued to attach itself to our Western interpretation of his teaching. By the "vain repetition" of magical formulas, by vows and gifts, by the exercise of implicit faith, God might be compelled to leave His preoccupied isolation and act in the affairs of the world, on man's behalf. Jesus attacked this idea of prayer on theological grounds. We are not dealing with a God who may be charmed or bribed or cajoled. Nor can such sharp distinction be made between God and the world. God operates in and through the forces of the Universe, rather than upon them, as upon a separate mechanism which requires His constant interference or adjustment. The Master refused to attempt a

spectacular feat which would violate the laws of Nature.[1] Science, from another angle, has made the conception of dualism and interference untenable. Man finds himself in a Universe of order and law. Control of natural forces is possible to him, only as he learns to know them and work with them. Magic, of whatever sort, can have absolutely no effect on the Universe.

God, as Jesus pictures Him, is near us, close to us, all the time and everywhere, knowing our thoughts almost before we think them, knowing what things we have need of before we ask, coöperating in every human function and activity, and supremely interested in each effort that we make toward the establishment of His Kingdom of character and goodwill. In the presence of such a God, prayer comes to be very direct and personal. We not only pray, as a natural and necessary part of our daily life, a recognition of our constant dependence on the Universe. We pray in an entirely new way. Our attitude is that of a son toward his father, that of a junior partner toward the great Head of the Firm.

Prayer, with Jesus, is not to give God information. It is not forcing man's desires on God. It is the coöperation of two harmonious wills. It is the adjustment of our plans and desires to the plans of the Universe. When men rise up to help God create what still is uncreated, to complete what needs completing, to remedy that which requires remedy, whether in their own lives or in the world around them, their conscious communion and petition is the expression of a faith, an attitude, for which God has been waiting. Man and God are acting in concert. The work of ethical and social development can go forward. Strength and beauty of character, the practice of altruism, international responsibility become daily realities, and help to mold human institutions. The Kingdom of God has begun on earth.

A discussion of the details of prayer, and its possible

[1] Matt. 4:5-7.

answers, does not fall within the scope of this book. We are concerned here rather with the value of the Christian attitude, fortunately far more widespread than the acceptance of Jesus' specific doctrine of prayer, in ethical and social movements. The Christian theory finds ample scope in analogies such as man's power of creation, the personal influence of one individual on another, and the practice of telepathy, as yet little understood. The answer to prayer, in any given case, must remain a matter of personal experience rather than of scientific demonstration. In practice the Christian assumes that his prayer will be answered, if it is in harmony with the character and methods of God. And this assumption justifies itself in his experience. An answer to prayer is a step toward the completion of the world. It is a response to man's co-operation in the Universe. On no other terms is it likely to occur.

On the Christian theory, prayer must consist to a large extent, not of petition but of consultation—bringing our work, our interests, our problems before the Father, and waiting for His answers. Waiting for the revelation of His plans, consulting our Architect for the building we must do, conferring with the Head of the Firm. Bringing before Him not merely our own character and our own tasks, but the world, the church, the community, the men and women in whom we take a special interest, the great causes we have at heart. Only then are we in a position to ask God for the equipment we need for our tasks, His help in the battle for a better world, His definite blessing on those for whom we pray.

Our effort must match our attitude. The petition must represent what Fosdick calls our dominant desire. "The great servants of the Kingdom were men of powerful prayer because they were men of dominant desires for whose fulfillment they were willing to sacrifice anything." [2] It would be a travesty on prayer to ask God

[2] Harry E. Fosdick, *Meaning of Prayer*, 1915, 150.

for peace of mind, when we are worrying ourselves into a nervous collapse. To pray for daily bread, and not go out to hunt for a job. To pray for forgiveness, when we cherish a grudge against our neighbor. To pray for a cause in which we are making no adequate investment. To pray for the triumph of Democracy, when we fail to show human consideration to the foreign laborer or the hired girl. Prayer is coöperation. Until we do our share in the social order, we are not coöperating; we are not praying, in the Christian sense.

One other condition should be fulfilled. The individual must leave his isolation and take his proper place in the social order. He must recognize the mutual rights and duties of everyday intercourse. He must feel social obligation. He must carry some of the burden of human sin and suffering, and the resolve for aid and improvement. A purely selfish prayer would be a contradiction in terms.

It is evident that this attitude of affection and confidence, the sense of personal and friendly partnership with a social God, is a force of immense creative value. To act in harmony with natural forces is essential, in all human effort. But to realize that we are acting in harmony with those forces, to see in them the hand of an active and kindred and sympathetic Power, to feel ourselves part of a Divine movement toward a great end—raises man's coöperation with the Universe to a new level.

Those who receive are those who ask; he that seeketh findeth. Opportunity beckons to those who are shrewd enough to coöperate with the Universe, according to the laws discovered by Jesus. A genuine prayer to God each morning for daily bread, begets in the workman an assurance, a faithfulness, an enterprise, which are not possible to one who takes his food for granted or regards labor as a necessary evil. To pray for guidance in the day's study or in pressing personal problems, helps to assure the atti-

tude of calmness and concentration which are essential to the best intellectual work and the clearest decisions. To ask forgiveness for one's sins and failures, and help in overcoming unworthy traits and throttling habits, gives the sense of forgiveness, the freedom of a fresh start. Prayer in temptation brings victory over the temptation. Prayer for health, when joined, as true prayer must necessarily be, with a genuine endeavor after normal living, tends to release the forces that makes for health. In all these cases the effect of prayer is more than reflex. The Universe makes a definite and tangible response, similar to the response which God makes to man's physical or mental effort. Prayer is simply effort raised to the personal and consciously coöperative plane.

The coöperative character of Prayer is seen even more clearly when we pass to petitions which concern persons or objects outside of ourselves. Here again prayer is an element in its own fulfillment, though the fulfillment will almost always transcend the original impulse or effort. Man and the Universe are united in a definite altruistic interest. Any prayer for others involves the thought of others, and the idea that their welfare, whether physical or moral, is of common concern to the worshipper and to God. Intercession opens the way to personal assistance. Prayer for others' health helps to create around them the atmosphere of health and confidence, without which medical means are seriously handicapped. To pray for one's enemy or one's competitor, is to exorcise the hatred and suspicion which form such serious impediments in the social order. Prayer is the strongest conceivable agent for social solidarity. In such a medium, isolation and cynical indifference cannot live. To bring before God the men of another race or class or nation, means the end of provincialism and caste and selfish nationalism. Under such circumstances, the exploitation of others would be impossible. To pray for one's city or country, helps to make one a loyal and dependable citizen.

When men unite in praying for a definite triumph of justice or for some movement for the betterment of humanity, it means the vitalizing of the common cause and the beginning of its realization. Human indifference or unwillingness has given place to active coöperation with a just and altruistic God. Such prayers do not interfere with the course of Nature. They release forces in the Universe which are as truly "natural" as are gravitation or chemical attraction.

We may now take up again the question which we laid on the table at the beginning of our fourteenth chapter: the Christian man *versus* the selfish and evil man, as each strives for a similar practical objective. It is clear that the Christian has an immense initial advantage, if he will only use it. He knows God. He is acquainted with God's general plan and purpose. He understands the moral currents flowing through the Universe. He has learned how to put himself in touch with these currents through the attitude of prayer. He has the strength which goes with character. His habits of consideration give him a definite advantage in dealing with others. His religion has brought an attitude of trust and confidence which are indispensable to the best thinking and planning. Once let the Christian realize that effort and study, attention and skill, carefulness and good management, are acts of communion, shared by God and expected to be acceptable service, and he will begin to pass the godless and evil man. Every human activity is enriched and strengthened and made more sure of success, when it is in conscious harmony with the Universe. Of this the Puritans and Quakers bear eloquent witness.

PART III.

THE MORALITY OF THE UNIVERSE.

Section 2. Industrial Relations.

XVII.

INDUSTRIAL WAR.

The view of the character of the Universe which we have gained from our study of man as an individual member of Society, must be tested further by a consideration of the Industrial Group. Back of our social life, in every phase, is the God to whose arrangements and activities we adjust our lives. Without Him we could not lift a shovel or solve an engineering problem or plan a business. The kind of Universe with which men are cooperating, should appear from the story of Industry's failures and successes.

In the next three chapters, and in the following section on national relations, it will be necessary to make our treatment more detached and impersonal. While we were discussing the individual man and the Universe, the relation between them was so obvious that in bringing it to the reader's attention the author felt free to disclose his personal interest in the matters under review, and even to drive home a lesson on occasion. From now on, until a certain abandon is allowed by the closing chapter, sentiment and exhortation are barred. We are entering fields of divided opinion and bitter controversy. Any personal bias, any assumption even of the functions of judge or ar-

bitrator, would defeat our purpose. We go in the spirit of social scientists. We seek to know the facts as to the behavior of human groups and its results, for the bearing which this may have on the character of the Universe. The colorless method of scientific analysis has its drawbacks. But it penetrates to a level of truth which prejudice and propaganda never reach.

The organization of industry which followed the introduction of steam was exceedingly rapid. It has taken less than a century to transform the simple slow-going world, where transportation was by horse-power or sails, and where manufacturing was carried on in the home, or by small groups in intimate relation with the employer, into the world of today, with its railroads and steamers, its electrical power, its giant corporations employing thousands of hands. Society had no precedents to guide such a development. There was no previous experience to suggest the dangers which such a transformation of industry would bring to employer and employee, and the ways by which these dangers might be avoided or reduced. The ruling political economy of the day was that of Adam Smith's *Wealth of Nations*. The business man was encouraged to make money, free from state interference, because in so doing he performed a service to the people needing his goods, and built up the wealth of the state.

This general theory of the relation between private enterprise and public welfare, appears to be sound. It has made for the development of public wealth: in increased supplies of food and other essentials, in convenience, in the rise of standards of living. For our purpose, which is to test the character of the Universe, it will not be necessary to discuss the existing economic system. Private profit in Industry is the only plan of which we have any practical knowledge, under modern conditions. Other systems may in course of time be conceived and put in operation. But we have as yet no basis of comparison, to determine whether they will represent a better adjustment to

our Divine environment. I propose to confine attention to the subject of industrial relations within the present system. Here we shall find enough diversity to make it possible to compare results.

As the modern era developed, the idea of mutual service was maintained, as far as trade was concerned. But it dropped out of industrial relations. The manufacturer came to deal with his employees as he did with his raw material. The laborer was no longer a chattel. He soon ceased to be bound to the employer as an industrial serf. But in securing freedom of contract, he had become a commodity. Labor was an element in the business to be bought in the cheapest market, according to the laws of supply and demand, and without personal obligation.

Workmen naturally came to follow the same principle. Their strength and skill was a commodity, which was to be sold for what it would bring. In fact it was the only thing they had to sell. The failure to dispose of it for a living wage meant privation, and sometimes suffering and death, for themselves and their families. After a long and tragic struggle, in the early days of the Industrial era, labor began to organize in its turn, in order to secure a betterment of wages and working conditions through partial or complete monopoly of the market. Industry, instead of being a relation of mutual service and obligation, tended to become a battle for personal or group advantage.

This purely selfish theory of industrial relations has been tried out for nearly a century. How has it worked? Laying aside abstract theories, sentiment and prejudice, let us ask what groups of men do under certain conditions, what are the general laws of human behavior as applied to Industry. Behavior Psychology is throwing new light on the study of Economics.

Limitation of space makes it necessary to confine attention to the two groups in direct contact: Management and Labor. I can refer only incidentally to Capital and to a

most important fourth party, the Consumer or General Public. An equally instructive study might be made of the reaction of the Public to the various policies followed by corporations and by labor groups.

I propose in this chapter to trace the immediate effect of a policy of exploitation, whether on the part of corporate management or of organized labor. Our purpose will be best served by studying some extreme but fairly typical cases from recent industrial history in the United States. I take them largely from the pre-War period, when conditions were more nearly normal. It is a pity to wash all this dirty linen over again. But frequent launderings are as necessary in Industry as in the home.[1]

In 1913, the bitter strike in the coal fields of southern Colorado, of which the Colorado Fuel and Iron Co. were the largest operators, led to an investigation by the Committee on Mines and Mining of the House of Representatives. The situation is described as "like a system of feudalism, with such regulations by law as the operators were willing should be put into operation." The company owned the land and buildings in the mining towns, and in many cases the road by which the town was reached. No employee was permitted to own his home, and dis-

[1] For the field covered in the next three chapters I consider the four best introductions to be John Graham Brooks, *Labor's Challenge to the Social Order*, 1920; John R. Commons, *Industrial Goodwill*, 1919; Ray Stannard Baker, *The New Industrial Unrest*, 1920; Ordway Tead and Henry C. Metcalf, *Personnel Administration*, 1920. See also Henry A. Atkinson, *Men and Things*, 1918; Stephen Leacock, *The Unsolved Riddle of Social Justice*, 1920; Samuel Crowther, *Common Sense and Labour*, 1920; John R. Commons and students, *Industrial Government*, 1921; Scott Nearing, *Poverty and Riches*, 1916. For studies of organized labor: R. F. Hoxie, *Trade Unionism in the U. S.*, 1917; Geo. G. Groat, *Introd. to the Study of Organized Labor in Am.*, 1916; Carroll D. Wright, *Battles of Labor*, 1906. Further bibliographies will be found in the text. For the parallel industrial movements in Great Britain, to which the plan of my book has allowed no reference, the student might make a beginning with Abbott P. Usher, *Introd. to the Indust. Hist. of England*, 1920; Sidney and Beatrice Webb, *Hist. of Trade Unionism*, revised ed., 1920; Meyer Bloomfield, *Management and Men*, 1919; Arthur Gleason, *What the Workers Want*, 1920; B. Seebohm Rowntree, *Human Factor in Business*, 1921.

charge meant eviction. Trading was practically restricted to the company store. In general the towns were such as might be expected under frontier conditions, with the saloon as the only place of recreation, though some welfare work had been attempted by the company. Local politics were notoriously corrupt. Interference by the company in elections was justified as an industrial necessity.[2] Juries were not selected according to law, and the machinery of justice was completely in the company's hands. Speaking of the method of drawing coroner's juries, an under-sheriff testified that he was "always instructed, when being called to a mine to investigate an accident, to take the coroner, proceed to the mine, go to the superintendent and find out who he wanted on the jury." The camp marshals and other guards were deputized as sheriffs and thus clothed with the authority of the state, although in the pay of the company and reporting only to the company. The spy system was used, to learn of possible disaffection among the men. An eight-hour law had finally been secured, but state officials testified that the enforcement of this and other laws was often difficult. The miners believed that they were frequently cheated in the weighing of coal, and did not dare to ask for the check weighman allowed by law. The operators claimed that the men were well paid and well housed, and well looked after in the matter of sickness or injury. In their view the workers were satisfied with conditions, and the strike was due entirely to labor agitators. The company refused to have any dealings with the miners' organization, the United Mine Workers of America. While in theory the men were allowed to belong to a union if they so desired, any one who talked union too much was liable to discharge as a trouble-maker. In some instances labor organizers had been trailed and roughly handled. The miners were absolutely without redress against the arbitrary and often tyrannical conduct of the local mine of-

[2] Supreme Court, Neely vs. Farr, *Colorado Reports*, 1916.

ficials. The company claimed the right to run its own business in its own way. Even after the reform which followed the strike, one of the officers said: "We hope and expect this plan to work so well that our men shall become as happy and contented as the European peasantry."

These conditions had led to frequent strife. A general strike occurred about every ten years. There was one in 1884, and another, the so-called Debs Strike, in 1894. Foreign labor was introduced by the mining companies, until the American miners numbered less than 25 per cent. The new blood proved equally untractable. The strike of 1903-4 was crushed by the company, after a bitter struggle and much lawlessness and violence on both sides.[3] In ten years, however, many of the strike-breakers introduced at that time had become sufficiently Americanized to attempt to force a recognition of the union. For several weeks both sides made preparations by buying arms and ammunition. The strike was called on Sept. 23, 1913, about half of the men going out, according to the operators' estimate, or 95 per cent, according to the union leaders. The rest remained at work, under promise of protection from the company. Trainloads of strike-breakers were brought in under guard. The self-evicted miners established tent colonies, conveniently located for picketing. Though they may have armed themselves originally as a measure of self-defense, there was an increasing tendency to push their case by intimidation and violence. The company men followed the same methods. The mines and mining camps were protected by mine guards, deputy sheriffs and detectives. Many of these were professional gunmen of a low order. The struggle resolved itself into a guerilla warfare between strikers and detectives. Outrages were committed by both sides. The calling in of the state militia on Oct. 28, only served to increase the bitterness, as they tended to act on the side of the opera-

[3] Carroll D. Wright, *Report on Labor Disturbances in the State of Colorado from 1880 to 1904.*

tors, many of the militiamen being former mine guards of a lawless and brutal type. On April 20, 1914, occurred the so-called massacre of Ludlow. The militia shot into the tent colony at that place and set fire to the tents, resulting in the death of 5 men and 14 women and children. In reprisal the strikers attacked a number of mines in the district, killing or driving out the guards and burning the buildings. The state of civil war was finally ended by Federal troops. The company persisted in its refusal to arbitrate, and, with the help of subservient state and county officials, proceeded to have the miners' leaders indicted for murder. The strike was finally called off by the miners on Dec. 14.[4]

That the miners had been subjected to unjust and undemocratic conditions, is confirmed by the later action of the Colorado Fuel and Iron Co. John D. Rockefeller, Jr., a director and large stockholder, had not visited the state for ten years, and refused to intervene at the time of the strike. His natural humanitarian instincts, rudely awakened to the situation by repeated criticism and the revelation of conditions, led him to adopt the plan of industrial coöperation worked out by W. L. Mackenzie King, the Canadian labor authority, who made a special study of the situation in Colorado. I shall refer to this in detail in a later chapter.

The Industrial Relations Commission, in its hearings at Seattle, Wash., in August, 1915, brought out much interesting testimony as to the seasonal labor problem in the Puget Sound region. There pass across the judicial stage the wise public official, the militant professor and social

[4] *Report on the Colorado Strike Investigation*, 1915; *Hearings before a Subcom. of the Com. on Mines and Mining*, 1914. A later investigation was made by the Commission on Industrial Relations: see Geo. P. West, *Report on the Colorado Strike*, 1915, very highly colored; *Final Report and Testimony*, 1916, 7, 6345 to 9, 8480. See also John A. Fitch, *Survey*, 27, 1706, Feb. 3, 1912; 33, 241, Dec. 5, 1914; and report by Henry A. Atkinson, pub. by Federal Council of Churches, 1914.

worker, the grumbling employer, whose apparent smugness and arrogance might be due partly to his being put on the defensive by the Commission's anti-capitalistic bias, the labor organizer, suspicious and censorious, the leader in the I. W. W., explaining his revolutionary philosophy in frank and picturesque language. That labor had a grievance was clear. During the summer local industries needed twice as much help as during the winter. Manufacturing plants required a surplus of about 23 per cent, this extra labor being used only a few months in the year. The men engaged in logging could not average more than six or seven months of employment, netting from $350 to $700, according to their skill. Owing to hard times in the lumber industry, the current wage for common labor had been reduced from $2.25 to $2.00, or $26 a month and board. Some men were receiving as low as $1.50, of which $1.00 must be spent for board. The "blanket stiff" (he was expected to provide his own bedding, and carried it on his back from one job to another), secured employment through one of the private agencies, and was herded to the job in a second-hand passenger coach, sometimes going a day or two without provision for food or water. In railroad construction work the fare in was provided by the company. In other cases the man's baggage was taken by the employer as security for the fare advanced, the employment agency fee, the hospital fee of $1.00 a month, and the first week's board. Food was almost uniformly good, at least in the logging camps, as it was necessary to keep the human engine properly stoked. Housing and sanitary conditions varied from good to unspeakably bad, the worst camps paying more attention to the condition of their horses than to that of their men. The labor turnover was very large. The men frequently quit after a few days' work, and started on another round of transportation, employment and hospital fees. One employer stated that in order to keep a crew of 138 men working, he had been obliged to employ 234 men during a given month. Most

of these men were shipped in originally for railroad construction work, drifting into other lines when this gave out. Some of them had left families in the East.

Leaving out of consideration the skilled workers in the mills and woods, it is evident that the continued employment of relatively unskilled men under the conditions described, had been developing a type of itinerant laborer, who worked at any job that came to hand. Receiving an inadequate and uncertain wage, a prey to the exploiters of his appetites, he had no chance to save money and make a home. Taking little interest in his work, restless under continuous employment, independent but not self-respecting, subject to constant graft and petty tyranny, he was bitter toward the employer class, and lent a ready ear to revolutionary propaganda. I have checked the testimony by my observations during six years' residence in a mill town in the lumbering region of Minnesota. Due allowance must be made for the operation of the law of supply and demand, the saloon temptations of that day, the inadequate and often corrupt employment agencies, and the abuses of the hospital system. But a large factor in the situation was the employers' handling of their men, not as human beings, whose welfare was important and whose loyal coöperation it was worth while to secure, but as so much muscle to be rented at the market rate, without further responsibility. Any one familiar with the conditions recognized the I. W. W. and similar movements as a natural reaction to the treatment received, a symptom of almost unbearable working conditions.[5]

Our third example is the situation in the woolen and cotton mills of Lawrence, Mass. The textile industries in all countries are carried on largely by unskilled labor, women and children being as valuable as men. The mills in Lawrence had prospered and expanded, until by the time of the strike of 1912 the city reached a population of

[5] Commiss. on Indust. Relations, *Final Report and Testimony*, 1916, 5, 4097-4571. See also Carleton H. Parker, *The Casual Laborer*, 1920.

85,000. Immigration from Europe furnished an unlimited supply of cheap labor. Successive waves, with lower standards of living, had tended to displace the American, British and German operatives. Male workers over 18 years of age averaged $10.20 per week (17.5% receiving less than $7.00), and female workers over 18 only $7.67. Even at these wages, continuous employment could not be counted on. In two-thirds of the families visited by the agent of the Bureau of Labor, the wife or other members of the family worked in the mills, in addition to the husband. In fact, it was difficult to make a living unless the family could supply at least two wage-earners. When a mother was compelled to enter the mill, the young children were usually boarded out during the day with a family which had an adult or older child available. About half of the children of the city between 14 and 18 were employed. Lawrence had the highest death rate of all textile cities, the infant mortality reaching 172 per thousand in 1909. Out of 188 typical households, 109 kept lodgers or boarders; members of the family totalled 941 and lodgers 368, or 1309 persons in 863 rooms. The workers lived in the wooden tenements which had grown up to meet the demand for housing. In the most congested districts, the rear as well as the front of the lot was filled with buildings, so close together that there was no room to set a garbage can, the population reaching 556 to the acre. To take a typical case, a Lithuanian family, consisting of husband, wife, four children under 13 and 4 lodgers, paid a weekly rental of $2.25 for five rooms. The husband's earnings, when he was able to work full time, were $7.25 per week, and $4.00 was received from the lodgers, who were provided with coffee in the morning and soup in the evening. The monthly expenditure for food averaged $16.80. While it may be doubted whether this particular family could save money, the savings banks of Lawrence averaged $62,000 of deposits each week.

The city had become virtually a foreign colony, of many

races and tongues. Of the newer immigrants, less than one half had learned to speak English. Sixteen out of every hundred could not read or write. Only three out of every ten eligible for citizenship had taken out naturalization papers. The mills treated their labor merely as a commodity. Not even the most elementary welfare work had been attempted. The old-fashioned method was followed by which the foremen did the hiring and firing. The workers were speeded up by the offer of premiums to the more skilled operatives, who acted as pace-setters. Any movement toward collective bargaining was consistently opposed. Various craft unions claimed a membership of 2500. But the unskilled laborers, overworked and underpaid, almost untouched by American standards and ideals, constituted an unorganized and undisciplined mass, where revolutionary propaganda found a ready soil. The Industrial Workers of the World, organizing along racial lines, had gained a following of about 1000.

On Jan. 1, 1912, the mills, in complying with the new state law for the employment of women and children, reduced the hours of all operatives from 56 to 54 hours per week. When the discovery was made that the weekly wage would be correspondingly reduced, the human worm turned. After two days of explosive violence, Joseph J. Ettor, an organizer of the I. W. W., took charge of the strike. Through the magnetism, wisdom and executive ability of this young Italian-American, the inchoate mass became a united and disciplined army. A strike committee was organized, composed of four representatives from each of the sixteen nationalities. Relief funds were secured through an appeal to labor sympathizers throughout the country. Though frankly revolutionary in his attitude toward capital, Ettor was not incendiary. His policy was passive resistance—withholding labor in order to stop production—aided by active picketing. There was much disorder and intimidation. But violence was restrained to such an extent that, with 23,000 at one time on strike,

only 296 arrests were made during the two months' period, many of them for minor offenses. The situation however was extremely tense. A slight cause might at any time have precipitated serious rioting and bloodshed. The strikers felt that the militia were there to break the strike; that they had arrayed against them the forces of government as well as of capitalism. Their bitterness was increased by the tactical blunders of the employer group, such as the arrest of Ettor and Giovanni on the charge of inciting to murder, which was not sustained by the trial court. Although the officers of the American Woolen Co., the principal protagonist, had claimed that the condition of the textile industry did not warrant larger wages, they were forced in the end to grant a substantial increase and make other concessions. The terms of settlement recognized the fact that the cheapest labor was underpaid, those on the lower wage scales being given a larger share of the increase.[6]

The end of the strike brought no change in the policy of the companies, and another bitter struggle broke out in 1919, the workers again winning their demands.[7] One of the most serious elements in the situation is the fact that these foreign laborers, with a new desire for freedom and a growing sense of their own power, are gaining their chief impression of our government from the Lawrence police.

We now turn to the other side of the shield. Examples will be given which help to explain the widespread hostility to the labor union on the part of employers.[8]

[6] Chas. P. Neill, *Report on Strike of Textile Workers in Lawrence, Mass.*, Bureau of Labor, 1912; *Hearings before the Com. on Rules of the House of Rep's*, 1912; W. J. Lauck, *Survey*, 27, 1772, Feb. 17, 1912. See also, from opposite angles, Justus Ebert, *The Trial of a New Society*, pub. by the I. W. W., 1913; John B. McPherson, *Bull, of Nat. Assoc. of Wool Manufacturers*, Sept., 1912.

[7] See John A. Fitch, *Survey*, 42, 42, Apr. 5, 1919; F. Ernest Johnson, *The New Spirit in Industry*, 1919, 9 *ff.*

[8] The Employer's case is given fully and fairly in the statement by three members of the *U. S. Commiss. on Indust. Relations*, 1916, 1, 235-248.

I begin with the historic struggle between the International Association of Bridge and Structural Ironworkers, and the National Erectors' Association, which started in 1905. The union was young, and intoxicated with its first successes. Frank M. Ryan, the new national president, was anxious to make a better showing than his predecessor. In the Spring of 1903, a general strike against the American Bridge Co., a subsidiary of the U. S. Steel Corporation, had brought an agreement between the employers' association and the union, which in practice meant a closed shop. Friction arose two years later over the employment of non-union men by sub-contractors, and by plants constructing buildings for their own use. The offer of the American Bridge Co. to yield the point in regard to sub-contracts, thus unionizing its construction work throughout the country, was rejected by the union, which made what Gompers has called the supreme blunder of insisting on all its demands. This, together with a breach of contract by the New York local, and a general strike of the structural ironworkers in that city on the refusal of a wage increase, roused the employers to aggressive action. On May 1, 1906, the National Erectors' Association adopted an open shop policy. Under the circumstances, the struggle of the union was not only for victory, but for existence, and for preservation of the high wages and the 8-hour day it had been instrumental in securing. Practically all other unions had been crushed out by the Steel Trust, within its field.

Since diplomacy had failed, the men turned to the common tactics of intimidation. In the early years of the fight there is a record of repeated assaults on non-union workmen. With the growing vigilance of the employers, and their use of detectives and spies, such work came to be increasingly dangerous. At the same time the temper of the union men grew more bitter. Their officers, with the tacit endorsement of the membership, began to employ professional thugs to carry out the assaults. When intimi-

dation of workmen failed to bring the desired result, resort was had to dynamiting the construction work and machinery of open shop contractors. In the course of six years at least 100 attempts of this sort were made, in various parts of the country. Ortie McManigal is known to have been the agent in 20 cases, and James B. McNamara in 16. They were paid $200 and expenses for each job. The lurid story may be read in the pages of McManigal's confession. The work was directed by John J. McNamara, secretary of the Ironworkers' Union, from the headquarters in Indianapolis, with the approval and coöperation of the other international officers. The blowing up of the *Los Angeles Times* building in 1910, with the loss of 21 lives, though done by James McNamara, seems to have been instigated by labor leaders in California.

McManigal, who had been shadowed for many months by detectives, turned state's evidence on his arrest. After trading on the sympathy of labor throughout the country, which believed the McNamaras to be victims of a capitalist conspiracy, and exhausting every corrupt method of breaking down the prosecution, the defense suddenly collapsed. The two brothers were obliged to enter pleas of guilty, before the case came to trial. At a later trial in Indianapolis, 38 other union officials and their agents were sent to the penitentiary. While out under heavy bond, pending an appeal, President Ryan was reëlected to office.

Let us now check up the results of this policy of intimidation. After six years, the union membership represented a relatively lower proportion of the trade. While some of the smaller contractors had yielded to threats and unionized their shops, many of these reversed their policy on the first opportunity. The National Erectors' Association, on the contrary, was stronger than ever. And the bitterness of its members toward union organizations was greatly intensified. The cause of organized labor had received its severest blow since the Haymarket Riot. Even

without the wave of public indignation which followed the dynamite trials, the union had failed to attain its object. In nearly 50 per cent of the industry union members were compelled to take work as individuals, at lower wages, and with no voice as to the conditions of labor.[9]

My next exhibit is a sample of what Hoxie called the predatory union. It will not be necessary to go into past history. In October, 1920, a committee appointed by the legislature to investigate the housing situation in New York City, unearthed a system of organized graft in the building trades. A Building Trades Council had been formed a year before, as a federation of most of the unions engaged in this line, including about 115,000 workers. Its President was Robert P. Brindell. Ephraim B. Levy, a contractor, testifies that he was employing about 150 iron and stone men on a two-million dollar office building on Seventh Avenue. It was understood to be a union job. The men struck without warning, with no grievance over wages or hours, and remained out for two months. Finally George Backer, the builder who was superintending the construction, agreed to get the men back. He could arrange it with Brindell; but it would cost money. The price named was $25,000. Mr. Levy paid over $15,000 in cash, with the promise of $10,000 more in a month or two. In a few days the men came back to work. He gives his testimony with considerable unwillingness and trepidation, as the building is not yet finished and he is afraid of further trouble. George Backer is called to the stand, and acknowledges receiving the money specified. After some wild stories about losing these sums in race-track gambling and at cards, he testifies that he sent the money to Brindell, whom he always called up when there was trouble on a building. Brindell claimed that the iron-workers were not union men, and he had

[9] Luke Grant, *Report to Commiss. on Indust. Relations*, 1915. This book is not only a fair presentation of the controversy, but a valuable study of working class psychology. See also Wm. J. Burns, *The Masked War*, 1913.

decided to make an example of this job. The matter could be fixed up, however. Backer had several interviews with two walking delegates, names unknown. At first they demanded $60,000, as they had to divide with a good many people, and the cost of living had gone up. Finally they agreed to the $25,000. The men were to be sent back to the job, and the first installment paid within ten days, the balance as specified. Said agreement was duly carried out, and after that the work went along nicely. Nothing more was said about non-union iron-workers, all erectors' shops in New York being in theory non-union. Brindell, he says, is absolute boss; strike or no strike depends on him; he can start or stop jobs any minute.[10] We learn of master plumbers adding 4% to their contracts, as an "insurance fund" handled by a certain lawyer, who kept 1% and handed over the other 3% to the unions. An attempt to bribe the mayor into signing a limestone contract of over two million dollars for the new Court House, in return for the political support of the Building Trades Council. The members of the House Wreckers' Union, in order to obtain work, forced to join a new union affiliated with Brindell's organization, at a cost of $50 initiation fee, and $10 a week. The 18,000 members of the Bricklayers' Helpers and Common Laborers Union paying an assessment of $2 a week, in return for which the Building Trades Council boosted their wages to $7 a day, and was preparing to add another dollar. And so, day after day, the slimy trail of graft is uncovered by the investigating committee. People begin to realize why contractors are unwilling to start any more buildings. New Yorkers recall a predecessor of Brindell, the notorious Sam Parks of two decades earlier, who after his conviction was chosen by his followers to head a labor parade. He proudly rode the length of Fifth Avenue, mounted on a white horse.

I reproduce, as Exhibit C, an open letter from the

[10] *N. Y. Times*, Oct. 22, 1920.

Superintendent of the Hamilton-Beach Manufacturing Co., of Racine, Wisconsin. "If ever the union labor had a chance to show what they could do, they have had it in this factory, because a little over a year ago this company turned its factory over to union labor, granting all the demands of labor and giving them more than they asked, and ever since then we have had our troubles. The union immediately appointed shop stewards in each of the departments and everything done in the factory had to go through these shop stewards. The last three months it was hell around this factory. All we had to do was to grant demands and the moment we refused they threatened to strike. The last thirty days the factory ran we had two strikes. In the first strike, the factory convinced the union officers that the men were wrong and they were ordered back to work. The last strike was because we laid off seven men in the tool room as we had no work for them. Without any notice, the entire tool room went on a strike. The following Tuesday morning the entire machine shop went on a strike that we presume was in sympathy with the tool makers. Up to this date the machinists have made no demands of the Hamilton-Beach Manufacturing Co. and we don't know what their trouble really was. Six hundred of our employees admitted the machinists were wrong by continuing to work. Of course on account of the machine shop being out on strike, it was impossible to continue operations, therefore the factory was compelled to close down. There were no objections to wages as everybody was satisfied with the big wages they were getting. There was no dissatisfaction about working conditions. The union simply wanted to boss the running of the factory. We waited all week in hopes of getting this matter straightened out as the company did not want to close and was anxious to get the matter straightened out so as to be able to operate as we are way ahead with orders. A week before the last strike, there were some men laid off for spoiling work. They went to the shop steward and

were ordered back to work. The factory was in constant turmoil. It was simply impossible to satisfy all the demands and quibbles made by the union. We granted nearly every demand we could in order to keep the factory running, but towards the last we simply could not satisfy them. We are very sorry that the factory had to close down, and put so many people out of work, but it simply couldn't be helped as they insisted upon striking. . . . Now, therefore, the company has decided that it will have nothing further to do with a closed shop. When this company opens up again, it must be an open shop. We will not allow shop stewards on the floor. We will not recognize union labor; however, we do not care whether a man is a union man. The company will operate what is known as an open shop. It does not discriminate between union and non-union men in its service, nor will it permit either union or non-union men in its employ to make this question one of contention between them." [11]

In the Chicago hearings of the Industrial Relations Commission, testimony was given by Charles Piez, President of the Link Belt Co., with which he had been connected for 25 years. A member of the Illinois compensation and factory act commissions, his general attitude toward labor and labor organization was intelligent and cordial. The union shop had not worked well, however, when tried in their Chicago plant. In the molding room, the output had been between 90 and 100 of the 6-inch rollers. The shop steward ordered the production cut down to 60. To prove that 60 was too small an output, the firm brought in a man from one of the machine shops, who in the first day, without previous experience, put out 90 rollers. But the limit was kept by the union at 60. Men were being paid full wages for two thirds the normal output. In the machine shop their experience was similar. When checked by figures from their other plants, the output in the last year of closed-shop operation had been reduced

[11] *Racine Journal News*, Aug. 21, 1920.

35 per cent. As the firm was obliged to compete with other factories having a smaller overhead expense, on account of their location, it could not continue in business without a coöperation on the part of the labor force that would ensure a larger output per man. "If those men arbitrarily reduced the output and show no sympathy with the problems we have and don't offer to coöperate with us in securing an outlet for our work, then we have to say: 'You are not the men we can represent, because we are virtually your agents in dealing with our customers. We are trying to find some opportunity to sell your labor. If you are unwilling to offer the same thing to this man in Birmingham that the man in Columbus offers he is going to take the Columbus man, and we can not do anything to help you.' "[12]

There are other counts in the opposition of employers to the labor union, but it may be as well to rest the case at this point.

It is clear that the selfish theory of industrial relations has been a good deal of a failure. From the standpoint of the Employer, while individual firms have made money through the exploitation of their workers, such a course has brought a hostility on the part of a large section of the the laboring class that is putting an increasing handicap on production. From the side of Labor, methods of violence have been condemned by the wiser leaders as short-sighted.[13] The exactions of powerful labor organizations in many cases, have produced an exasperation and fear in the employer class which hinder the legitimate demands of Labor for better conditions. From the standpoint of the Community, the production of goods, which is the object of our highly specialized industrial organization and equipment, is only 15 to 25 per cent of the capacity of our workmen, according to recent estimates. The effect of this situ-

[12] *Final Report*, 1916, 4, 3175 *ff.*

[13] The evidence for this is well presented by Robert Hunter, *Violence and the Labor Movement*, 1914.

ation on the cost of living and on ultimate buying power is extremely serious. Even with the recent high average of wages, living conditions in many of our industries have been mortgaging the health and efficiency of future generations. And we face a spirit of radicalism, which is only spread further by attempts at repression. A year ago, in New York City alone, there were said to be 46 newspapers, with a combined circulation of 1,200,000 per issue, advocating the overthrow of the existing system of government. We do not need to go to Russia for evidence as to the natural reaction produced by a policy of autocracy and exploitation.

XVIII.

ATTEMPTED REMEDIES.

The sickness of the body industrial, so apparent to everyone, has invited the attention of a long list of doctors. Still holding the standpoint of Behavior Psychology, let us examine some of these attempted remedies, for the light they may throw on the nature of the Universe. Our order of treatment will be topical rather than historical.

The improvement of working conditions has tended to stabilize labor. As we have already considered the situation in the lumber camps of Washington, equally unsatisfactory to employer and employed, I give as a contrasting picture the model plant whose policy was thus stated by W. J. Rucker, a member of the firm, himself a former woodsman. "I believe in the employment of labor that it is important that you treat them right, and that you keep a good sanitary condition about your camps. . . . I don't believe there is labor in any part of the United States that compares with the labor in the logging camps and sawmills of Puget Sound. I believe they are possibly more intelligent, better informed, and, by being a little careful in selecting, just as honorable." Men were not employed until they could give references as to character and fitness. Expensive provisions were made for sanitation. The rooms in the company camps were provided with steam heat, electric lights, and hot and cold water. Bedding, blankets, and even sheets were furnished. In other words, the same care was being taken for the men's cleanliness and comfort, as all the lumber camps had found it necessary to take with their feeding. Every encouragement was given them to

save money and own their own homes. The logging and milling operations were made continuous rather than seasonal, and the wages paid averaged considerably higher than in other plants. In the making of shingles, speeding-up was discouraged, in order to secure a higher grade of product. Of the 231 men employed in the saw and shingle mill (135 of them married), 149 had been with the company for a year, and 50 for five years or over. Of the 117 men in the logging camp (36 of them married), 64 had worked a year or more. The concern was making money, at a time when competing firms were barely holding their own.[1] Mr. Rucker writes me that their operations continued to be satisfactory during the War period, when the labor problem in most of the Washington mills was extremely serious.

Many employers went a step further. From providing wholesome and agreeable working conditions, which is a proper and remunerative charge on any industry, they passed to definite plans for the welfare of their employees. These ranged all the way from beautiful factory surroundings and model homes, to provisions for recreation and general schooling. In some cases the motive was frankly to secure contented workmen, and forestall trouble from labor unions. In other cases the employer undoubtedly considered himself a philanthropist, using his wealth and power to benefit the men and women working under him. To a certain extent the movement has secured the loyalty of employees.[2] It has helped, as Brooks says, to make work more than a routine, and labor a human relation rather than a commodity.[3] The experiments made by individual firms have raised the standards of Industry, for example in factory construction, or in provisions for safety.

[1] *Commiss. on Indust. Relations*, 1916, 5, 4304 *ff.*, 4515 *ff.*

[2] Of 174 establishments studied by the Bureau of Labor Statistics, 136 stated that there had been a reduction in the labor turnover. *Bull. 250*, 1919.

[3] *Labor's Challenge to the Social Order*, chap. 7. See also Chas. R. Henderson, *Citizens in Industry*, 1915; Ida M. Tarbell, *New Ideals in Business*, 1916; Geo. M. Price, *The Modern Factory*, 1914.

Henderson reminds us that, as private charity developed into a responsibility assumed by the state, so the benevolent works of employers soon come to be required by law.

Underlying this attempted remedy, however, is an element of unsound psychology. Self-respecting people resent charity. They value what they pay for and have a share in achieving. Welfare work, under whatever guise, has frequently been resented by the worker as a form of feudal paternalism, a taxation of his earnings for something he did not want or preferred to secure for himself, an attempt by capitalism to stifle the legitimate desire of the working class to improve their own status through organization. The classic examples are the bitter strike in the model city of Pullman in 1894, and the partial failure of the National Cash Register program in 1901. This feeling has been growing in intensity during the last few years. So strong is the present suspicion of "welfare work" on the part of organized labor, that even the term has been discarded by progressive managers. The function of the modern "service department" is to secure the conditions under which labor is most efficient.

Profit sharing has been tried, in various forms, as a panacea for industrial unrest and inefficiency. In addition to a fixed wage, payments in money or stock are made to employees, with the object of securing an interest in the work of the plant, and a more permanent labor force. There are many rocks in human nature on which such plans meet shipwreck. The mere hand-out savors too much of charity. Periodic cash payments soon come to be accepted as a right, and cease to be a stimulus. The reluctance of the average firm to open its books to the public, leaves a suspicion of profiteering and economic injustice. In the Willys-Overland Co. of Toledo, a profit-sharing plan was announced at the beginning of 1919, on a basis of half and half. At the end of the first quarter, $415,000 was distributed to the employees as their share. The men struck a few days later. Their claim was, if 50 per cent of the

profits amounted to as much as that, the firm could afford to raise wages. With a large labor force, it is difficult to educate the rank and file in the principles and practice of profit-sharing; the relative effect of each workman on the total profits is too small to serve as an incentive to increased effort, watchfulness and team-work. Some of the most successful schemes are those which share profits in the form of credit on the purchase of company stock. The employee not only becomes a financial partner in the enterprise, but he learns the habit of thrift and provides an income for the future, in many cases supplemented by a service pension. Unless properly safeguarded, for example by some provision for selling one's stock back to the company, this tying of the employee to the business has its own social dangers, which organized labor has been quick to detect. It interferes with the worker's freedom to better himself by a change of employment. It undermines his power to bargain collectively for better conditions, and enforce such demands by a strike if necessary. As the collaborators in the volume on *Profit Sharing* put it: "An employer's freedom from strikes should rest upon fair wages, good conditions of employment, considerate treatment, deserved loyalty, and recognition of efficient service. . . . It is in enhancing the desirability of employment with a fair employer that genuine profit sharing can play its part in promoting industrial peace." [4]

The opposition of organized labor to compulsory arbitration and legal limitation of the right to strike, illustrates the same psychological principle. The modern workman cannot be compelled to work under unsatisfactory conditions. The nearest approach to this is the Australian plan of fining those who refuse to abide by an award, under a system of arbitration they have freely entered. The superiority of voluntary agreements was well stated by the U. S.

[4] Burritt, Dennison, Gay, Heilman and Kendall, *Profit Sharing*, 1918, 91; Boris Emmet, *Profit Sharing in the U. S.*, Bur. of Labor Statistics, *Bull. 208*, 1917.

Board of Mediation and Conciliation, for railway disputes. "There is no decision against either party, and neither of them suffers defeat. The indispensable service in which they are engaged goes on under conditions to which both parties have agreed, and this largely insures those harmonious relations between employer and employee which are so essential to working efficiency." [5]

Before the War, government regulation of industrial relations was confined largely to sanitation, safety and the restriction of woman and child labor. Minimum wage laws have been passed by the more progressive states, but they apply only to female and minor workers.[6] Mere man, though no longer protected by an exclusive ballot, must work for what he can get. The War Labor Board, like a just but firm parent, settled something like 500 quarrels in the course of a year's time, adjusted grievances, and made American industry repeat this creed: no strikes during war time, the right of workers to organize and bargain collectively through their chosen representatives, equal pay to women for equal work, and the right of all workers to a living wage. Unruly children were threatened with a spanking, as when munition workers in Bridgeport went out on strike because they were dissatisfied with the award. They were told by President Wilson that if they persisted they would be barred from employment in war industries and lose their claim to exemption under the draft. In the case of one recalcitrant employer, punishment was actually carried out, when the government took over the plant of the Smith and Wesson Co., which had refused to comply with the Board's recommendations. These examples had

[5] Report for 1913-1917. See also Report of *President's Industrial Commission*, 1920; Geo. E. Barnett and David A. McCabe, *Mediation, Investigation and Arbitration in Indust. Disputes*, 1916; Carl H. Mote, *Indust. Arbitration*, 1916; Mary T. Rankin, *Arbit. and Concil. in Australasia*, 1916; Research Reports of Nat. Indust. Conference Board: *Canadian Indust. Disputes Investigation Act*, 1918; *Arbitration and Wage-Fixing in Australia*, 1918.

[6] Chas. H. Verrill, *Minimum Wage Legislation in the U. S. and For. Countries*, Bur. of Labor Statistics, *Bull. 167*, 1915.

a good effect. Thereafter, for some months, the decisions of the Board and the principles on which they were based were accepted without question by all parties concerned. In fact it developed, as its secretary says, into a supreme court of industry, which adjusted disputes so that maximum production was secured.[7] With the coming of Peace, the nation reverted to a state of industrial war.

The bonus plan has been a favorite method of stimulating production and securing a satisfied and loyal labor force. Modern industry has tended to rely exclusively on the money incentive. It has assumed that men are naturally averse to labor, that they must be stimulated to work by the necessity of securing a living for themselves and their families, and by the offer of greater rewards for increased effort. Acquisitiveness is undoubtedly one of the most powerful human instincts. We have learned a good deal in recent years as to the way this motive operates. One thing we have discovered is that acquisitiveness, once strongly stimulated, cannot be satisfied. The more the worker gets, the greater his wants. The recent demand for increasingly higher wages, and the absorption of such wages in a higher scale of living, is due largely to the standards set by the employer class, with which the newspaper and the moving picture have made the worker thoroughly familiar. That efficient labor in America will ever be satisfied is not probable, nor is it desirable. The satisfied workman either does little work because he has few wants, or he is too exhausted and cowed to desire better conditions and make an effort to secure them. High wages do not necessarily mean a high labor cost per unit of output. Wm. C. Redfield proved years ago that the well-fed and ambitious American workman would submit to a strain of rapid productive effort, of which the low-priced foreign workman was not capable. He cited the American carpenter in Paris who did more work at $4.50 per day than four French carpenters at $1.90; the fact that his factory

[7] *National War Labor Board, Docket*, vol. 5, 1919.

could fill orders in Belgium in competition with the local factories, which paid the lowest wages in Europe; the inability of Japanese shops to replace American locomotives on their railways, because, though paying one-fifth of our wages, the labor cost was three and a half times greater.[8] Henry Ford's high-wage plan, with a high standard of living and saving enforced by inquisitorial methods, has lowered labor turnover and increased output. High wages do not mean "contented" workmen. But if other conditions are equally satisfactory, the firm which pays above the standard wage is likely to have a more loyal body of workers.

Another thing we have learned is that acquisitiveness may be satisfied so rapidly that it ceases to be a stimulus. In the studies which led up to Scientific Management, Taylor made the discovery that a 60 per cent rise in wages was the largest increase which could be safely offered as an incentive.[9] If given more than this, men tended to become irregular, shiftless, extravagant and dissipated. An interesting confirmation of this is the lowered efficiency of labor under the tremendous wage increases of the War period.

The stimulus of a bonus for increased effort may be unsocial and harmful in other ways. Organized labor has strenuously opposed piece work, on the ground that the ambitious worker was led to increase his own output, and lose his sense of obligation to the other workers in the trade. Too often the tendency of employers has been to use the swift workman as a pace-maker, and speed up the rest of the labor force to the point of exhaustion, at the same time lowering the piece-rate. Part of the objection to "Efficiency" is due to the memory of such injustice. When properly installed, this system guards against exhaustion by a study of the motions through which the task can be

[8] *Congressional Record*, 62nd Cong., 1st Session, 1911, p. 1939 *ff.*

[9] Gantt states that "the additional amount needed to make men do as much as they can depends upon how hard and disagreeable the work is, and varies from 20 to 100 per cent."

performed in a given time, without fatigue. On this the bonus or differential piece-rate is based. The rate, once determined, could not be cut without defeating the entire scheme. But the worker has no guarantee that a cut will not be attempted, by indirect methods. Nor can he be sure that the time study has been accurate and unbiased, unless he or his representative also holds a stop-watch, as in the Men's Garment Agreement.

Scientific Management, as developed and applied by Taylor and others, must rank as one of the great achievements of our age. It means the gradual rearrangement of all the details of the productive process in the light of exact study, the elimination of waste and lost motion, and the consequent cheapening of production. Our concern here is merely with the psychological effect of efficiency systems on the worker. The standardizing of industrial tasks, through job analysis, motion study and the use of the stop-watch, is in itself of great value to Labor, which will in time accept it, as it accepts improved machinery. The development of the worker into a perfect machine is not necessarily harmful or distasteful. The athlete, as Gilbreth says, is a perfect machine, and finds joy in his new sense of power. Taylor's pig-iron handler, who learned to load 47½ tons of iron in a day instead of 12½, without fatigue, may have had something of this feeling, besides the extra 70 cents in his pocket. The chief objection to Scientific Management, from the standpoint of Labor, is that it tends to over-specialization, offers no encouragement to initiative, and makes the worker merely an adjunct to the machinery of the factory. In other words, the system runs counter to human nature, with its diverse temperaments, its spirit of democracy and collective action, and its desire for the free play of other instincts besides the love of gain.[10]

[10] R. F. Hoxie, *Scientific Management and Labor*, 1915; Clarence B. Thompson, coll. of articles on *Sci. Management*, 1914; Frederick W. Taylor, *Prin's of Sci. Management*, 1911.

One important advance that has come in the wake of Scientific Management, is the taking of hiring and firing out of the hands of the foremen, and assigning it to a special Employment Department. The aim is to stabilize the labor force, and reduce the expense of constantly breaking in new workers, which in the average plant runs from $50 to $200 per man. With a large force this loss mounts to tremendous proportions. Among the methods followed are physical examination, careful selection, the fitting of the worker to the job, investigation of all cases of discharge or resignation, and the shifting of dissatisfied workers. The results achieved bear witness to the importance of the human factor in industry. The new profession of Employment Management, or Industrial Engineering as it is sometimes called, is developing standards and methods, and considerable knowledge of practical psychology. Courtesy and consideration have attained a new business value. The initiative, enthusiasm and social responsibility of this group, is matched only by the new profession of Safety Engineering.[11]

The crux of the industrial problem, even in normal times, is the fluctuation in business, and hence in the demand for labor. Men are taken on or laid off as the market ebbs and flows. Such a policy is expensive for the plant, like all labor turnover. What unemployment or the fear of unemployment means to the worker, only the worker knows. In the past, factory policies have been determined

[11] See, from the economic standpoint, A. C. Pigou, *Unemployment*, 1913. On the practical side: S. H. Slichter, *Turnover of Factory Labor*, 1919; *First National Conf. on Unemployment*, Am. Labor Legis. Rev., May, 1914; and the classic study of an English city by B. Seebohm Rowntree and Bruno Lasker, *Unemployment*, 1911; Lee K. Frankel and Alex. Fleisher, *The Human Factor in Industry*, 1920; *Personnel and Employment Problems*, Am. Acad. of Pol. and Soc. Sci., 65, May, 1916; Daniel Bloomfield, *Labor Maintenance*, 1920; and coll. art's on *Employment Management*, 1919; Roy W. Kelly, *Hiring the Worker*, 1918. Compulsory insurance in its various aspects is well covered by I. M. Rubinow, *Social Insurance*, 1913; *Proceedings of Conf. on Soc. Ins.*, Bur. of Labor Stat's, *Bull. 212*, 1917.

largely by the sales force. To make employment continuous it is necessary to have them determined by the production department. Let me instance one group of plants with which I am familiar, employing about 20,000 workers. Instead of baiting the consuming public by new lines of goods, the product is being standardized for steady sales. Standardization also enables the company to shift orders from one mill to another, thus helping each plant to keep running to its normal capacity throughout the year. This part of the business is in the hands of a well-developed planning department.

The training of new workers has become a serious problem. With the break-down of the apprentice system, and the splitting up of industrial operations so that less skilled workers can handle them, we are in danger of losing the old-time journeyman's sense of craftsmanship. In fact this loss of a creative interest in the job is one of the chief factors in the present industrial situation. New hands are thrown into the plant to find their own way, and learn their trade by watching the older operatives. The high labor turnover in the first few weeks is a natural result. To reduce this waste, and secure an adequate supply of trained and interested workers, progressive plants are introducing "vestibule schools," or training departments as they are now generally called. The plan commonly followed is to give the learners a general introduction to the plant, explaining the policy of the company and the principles of shop ethics, and then place them in a special training room under skilled instructors. They are paid a fair weekly wage, often with a bonus for piece-work production above a certain standard. The course varies from a few days to eight weeks, according to the amount of skill required. The Packard Motor Car Co., one of the pioneers in the movement, uses one teacher to every six pupils in elementary instruction, and one to three for assembling and machine work. Their aim is to give a good general training, and skill in operating various machines, thus adding

interest to the work and making the labor force more mobile. Questions are encouraged. The learner is made to feel from the start that he is a member of the organization and not an outsider. Careful records are kept for each pupil, and the instructors keep in touch with them after they graduate into the shop. In such factories we usually find a policy of promoting workers who prove themselves efficient.

As a method of breaking in new workers, the training department more than pays for itself, through the reduction in labor turnover, spoilage and accident. Old employees are often sent to the school for special training. A certain large factory picked out, for comparative study, a worker left to himself, and one sent to the training room. The former stayed at his original level, while the latter showed improvement after 7 days, and in 21 days doubled his output. A new worker, after 4 days in a training department, was able to better the average production in the factory. In one machine shop, inexperienced men, after a few days training, were making a bonus of $7.50 on piece work, as compared with $5.50 for old hands. The effect on morale appears to be equally good. Replies received from 16 training departments indicate that "it is well to give as broad training as possible. Those who are willing to spend the time and money to teach the learners shop mathematics, use of precision instruments, drawing and reading of blue prints, invariably report that it pays. The more the employee knows the better worker and the more contented he is. Industrial education of this sort is a sound and practical investment." [12]

Each year approximately one million children leave school before the age of 18 to earn a living. The voluntary introduction of training departments can cover only a fraction of the industrial field. Few plants are willing to

[12] *U. S. Training Service*, Bull's 12 and 13, 1919; H. E. Miles, *Survey*, 43, 700, March 6, 1920; Roy W. Kelly, *Training Industrial Workers*, 1921.

go to the expense of training workers, only to have a large proportion of them enticed away by other factories that have made no investment in their education. And the tendency of many training departments is to turn out narrow specialists. Technical efficiency is cultivated, at the expense of general intelligence, initiative and adaptability. By the Smith-Hughes Law of 1917, the Federal Government supplements grants made by the various states for industrial education of a broad type. Up to the close of 1919, 19 states required employed minors under 16 (in some cases 18) to attend part-time continuation schools during the school term, the minimum requirement ranging from 4 to 8 hours a week. The training is often given in industrial plants, under public supervision.[13]

Two facts stand out from our study of these attempted remedies for industrial war, in their successes and failures. The first is the common interest of the two principal parties to the work of production.

Orthodox Unionism and Marxian Socialism are perfectly correct in stating that there is a class conflict between capitalist and laborer over the distribution of the rewards. There is a similar conflict within the ranks of labor itself, as between skilled and unskilled workmen, or between one skilled group and another. If a rise of wages for clothing workers increases the labor cost, all other workers must pay more for their clothing. The equitable distribution of the rewards for production, is a problem which Society may be expected to solve, after long experimenting. It is becoming obvious to all thoughtful students of the subject that goods must be produced before there are any rewards to distribute. As Gantt says: "It is of course impossible to pay permanently high wages unless a large amount of work is done for those wages." From an entirely different angle, we have the statement of Spargo: "The first great

[13] Fed. Board for Vocational Educ., *Third Annual Report*, 1919; David S. Hill, *Introd. to Vocational Educ.*, 1920; Albert H. Leake, *Indust. Educ., its Problems, Methods and Dangers*, 1913; Helen Marot, *Creative Impulse in Industry*, 1918.

task of any Socialist society must be to increase the productivity of labor. . . . If the working class of this or any other country should take possession of the existing organization of production, there would not be enough in the fund now going to the capitalist class to satisfy the requirements of the workers, even if not a penny of compensation were paid to the expropriated owners." [14]

What our study has indicated is the benefit that has tended to result to both employer and employee from the improvement in conditions of labor and the increase of reward, with a resulting rise in standard of living. One cannot read Miss Tarbell's book on *New Ideals in Business,* without a realizing sense that good treatment is good business. The ideal of a recognized common interest in the work of production has been eloquently expressed by King. "Let Faith be substituted for Fear; let mutual consideration and confidence supplant suspicion, and constructive good-will replace resistance; let the parties to Industry recognize a mutuality, not a conflict of interest, in all that pertains to maximum production and equitable distribution of wealth; and what is the result? Immediately, fresh energies are released, a new freedom is given to effort in Industry. Productivity is increased, as are also the respective rewards of all the parties." [15]

The second fact suggested by our study helps to explain the present difficulty in realizing this ideal. It is apparent today, even more clearly than in the pre-War period, that good treatment of labor may bring bad results. This fact has mystified many employers. But it simply means that there are psychological factors, the neglect of which may vitiate the advantage of better working conditions and larger rewards. The parties to Industry are individual human beings, not machines. The employer is human. His unconscious hypocrisy, his patronizing paternalism, even his indigestion or domestic troubles, may affect the

[14] John Spargo, *Bolshevism,* 1919, 287.
[15] W. L. M. King, *Industry and Humanity,* 1918, 261.

spirit of the entire plant. The foreman is human. A pig-headed or bad-tempered or domineering overseer has been known to undo the best-laid plans of the management. The workman is very human. He has his own moods and whims, his family or financial worries, his days of nervousness and low vitality. He is filled with the traditions and prejudices of his race, religion, class and trade. No two workmen are alike. One likes to work under strict discipline, another resents authority. One man may enjoy a monotonous task, where his mate, apparently with no higher intelligence, is irritated by it. In different groups of workmen, we find the same infinite permutations of personality, complicated by racial mixtures and the character of the group leadership. The proper handling of industrial relations is indeed a fine art. No mechanical scheme can be counted on to give specific results.

The most striking characteristic of the present-day workman, particularly in the semi-skilled trades, would seem to be his independence. The democratic spirit has gripped him. He is no longer satisfied with mere freedom of contract, or a cinch-hold on the rewards of production. The recent situation in Industry has been thus interpreted to me by an industrial relations manager, who had been able to gain the worker's point of view through several years of practical experience. Before the War, with the surplus of labor and the fluctuating demands of Industry, the dominant motive was fear. The workman was haunted by the dread of losing his job. He did what he was told to do, and speeded up his output, on pain of having his place taken by another man. A type of foreman was developed whose success was gauged by his ability to drive the men under him. During the War, with the curtailment of the labor supply and the demand of the Nation for increased production, employers appealed to their men for coöperation in the industry, on patriotic grounds. This appeal met a somewhat general response. A large number of plants installed some plan of employees' represen-

tation, of which I shall speak later. On the part of the employers, however, this idea was not deep-seated; it was intended merely for a patriotic emergency. Most of them proceeded to forget it, and hoped that their employees would do the same. But the workmen did not forget. They felt that they had been promised certain things, and that these promises ought to be fulfilled. They had been given a taste of democratic management, and refused to go back to the old autocratic relations. With the continued labor shortage, they had lost their fear; they could no longer be driven. The result was seen in the general industrial unrest, and, more specifically, in lowered output, irregularity in reporting for work, and the tremendous increase in the labor turnover, the proportion of new men hired reaching in some plants as high as 1,000 per cent a year.

How far this free and democratic spirit will evaporate under changed economic conditions, no one can predict. The fear of unemployment is again enforcing discipline and increasing output. But a man's experience of democracy is like a ratcheted wheel, which goes forward but cannot go backward. I am inclined to think that what Henderson wrote six years ago is even more true today. "The modern workman never can be morally content and satisfied as long as his mind, will and voice count for nothing in the direction of the industry and its product. He may not yet be adequately prepared for that responsibility; his ambition may outrun his education, but he is looking forward to it, and he chafes while he waits." [16]

Our study has shown that the motive of acquisitiveness cannot be utilized beyond a certain point for the stimulation of output. There are other important instincts, however, which modern Industry has tended to overlook or suppress. Increasing specialization has left little scope for

[16] Chas. R. Henderson, *Citizens in Industry*, 1915, xv. *Cf.* Report of *President's Indust. Conf.*, 1920; Wm. R. Basset, *When the Worker Helps You Manage*, 1919; Meyer Bloomfield, *Survey*, 28, 312, 1912.

the creative instinct, the craftsman's joy in the finished product. There seems to be no possibility of going back to the old system, where the worker in a shoe factory, for example, made a complete shoe. To secure a general revival of the spirit of craftsmanship, two lines are being followed. The first is educational. Much may be hoped for from the modern movement for vocational training, of which I have already spoken. The second line of approach is the development of a worker's interest in the industry through some measure of democratic control. We all find greater joy in work when we feel a sense of partnership in the process, or ownership in the product. "The kitchen-maid may very easily find the dish washing a drudge's task, while the housewife does not so consider it. The difference lies in the interest of the worker in the household as a member of it." [17] The same psychological fact is likely to be true in Industry. Democratic control allows scope for the instinct of self-assertion, and for the herd instinct, which leads men to act together and follow the leadership they have themselves helped to create. Experiments along this line will occupy our attention in the next chapter.

[17] Fred H. Colvin, *Labor Turnover, Loyalty and Output*, 1919, 25. See also Ordway Tead, *Instincts in Industry*, 1918, an invaluable book for the student of industrial relations.

XIX.

DEMOCRACY IN INDUSTRY.

From the standpoint of Society as a whole, our elaborate industrial organization is not for the sake of profits or wages, but rather for the production of community goods and the development of complete men. A system which fell far short of the possibilities of production, or which dwarfed the many for the sake of the few, must be regarded as a social failure. And social failure is cosmic maladjustment, a lack of harmony with the fundamental conditions of the Universe. There are therefore two general criteria for the success of an industrial policy: its ability to maintain the highest quantity and quality of production, or whatever public service is to be performed, and its physical and moral effect on the men engaged in it. The two are closely related. To obtain a high output from the worker, as we have seen, it is necessary to secure, not only proper working and housing conditions, but the free expression of those instincts which lead workmen to do their best work. These factors in turn aid the full development of personality. It is in his daily task that a man normally finds his life and maintains his self-respect.[1]

In this chapter I shall outline some of the experiments that have been made along the line of industrial democracy. They will indicate the results which may be expected from the stimulation of other human motives, in addition to those involved in financial rewards.[2] The fol-

[1] See Whiting Williams, *What's on the Workers' Mind*, 1920, chap. 12.

[2] See *ante* p. 209.

lowing examples are chosen to illustrate various types of coöperation.

The Endicott-Johnson factories, near Binghamton, N. Y., the largest shoe manufacturers in the United States, have often been cited as an ideal of industrial relations. The owners grew up with the shoe and leather business, and Geo. F. Johnson, to whom the labor policy is largely due, started life as a shoemaker. About 13,000 workers were employed. In over 36 years there had been no suspicion of labor trouble. Labor leaders who visited the plant made no attempt to organize the workers, stating that the company was doing for its help what the unions were trying to do. The workers were well paid. Everything possible was done for their comfort and enjoyment, and that of their families. They had absolute confidence in the management, which was constantly striving to understand their point of view. There were no formal shop committees. Every employee knew that he could go directly to the general manager, if he felt that injustice was being done. The employers and employees sent their children to the same schools, attended the same churches, and were interested in the same sports. The policy of the company was to fill no important position outside of its own ranks, and the door of promotion was always open. The workers were encouraged to make suggestions for improveing the business; one laborer was paid $5,000 in cash for a valuable idea. Profit sharing was introduced at the beginning of 1920, not as an incentive, but as a logical outcome of the mutuality of interest.[3]

It is obvious that such close personal relationships are impossible in the average corporation of the present day, whose managers have received their training in business rather than in the industrial process itself. I have given this example, partly for its historical interest, as illustrating the survival in a large modern plant of the old time re-

[3] The ideals of the owners are described in *Red Cross Mag.*, Dec., 1919; *System*, Jan., 1920; *Outlook*, Apr. 14, 1920.

lations of master and men; partly because it suggests the spirit of fair dealing and sympathetic understanding which lies at the basis of successful labor management. Many corporations are requiring their future superintendents and staff officers to spend weeks or even months at the bench, in order to gain the point of view of the man with the dinner pail.

Another ideal, showing what may be accomplished by arousing interest in productive processes, is found in the work of Robert B. Wolf with the sulphite pulp plant of the Burgess Co., at Berlin, N. H. In six years time, an annual output of 42,000 tons of the lowest quality was changed to 111,000 tons of the highest quality. "His first step was the working out of scientific standards for the tasks. To begin with, for example, there were nine men engaged in the important process of cooking the pulp. Each man cooked by his own rule-of-thumb method, and the result was nine different kinds of pulp, of varying degrees of badness. There was on the staff of the plant a chemist, whose function was to make certain stereotyped tests. Mr. Wolf proceeded to make work interesting for the chemist by putting him at the job of improving the quality of the pulp. For a long time he studied the cooking process, and through the coöperation of the workmen who did the cooking he accumulated a large amount of technical data. At length, by the use of this data, and again with the help of the workmen, a combination of variables, temperature, pressure, cooking-time, etc., was worked out which produced good pulp. A chart was plotted which showed graphically the different factors in the 'ideal' cooking process. The cookers readily grasped this chart, and they were then able to compare their own performance with the chart and gradually to make their efforts approximate the standard. . . . Progress records, either for individuals or groups, were worked out to affect almost every one of the twelve or thirteen hundred men in the mill. It is interesting to know that this scheme was

first hit upon by accident. Mr. Wolf planned a bonus system, and when this was turned down by the owners of the plant he conceived the idea of posting the records from which the bonuses would have been paid. As an improvement on purely quantity records quality records were evolved, and it was found that certain hard feelings engendered by quantity competition disappeared and that a spirit of intelligent coöperation among the men took its place. To improve their own work men made suggestions for improving operating conditions, which eventually resulted in the redesigning of most of the apparatus. Then one day a workman said, 'We don't know what things cost; if we knew we could save materials.' The result was that cost sheets, which had first been given only to heads of departments, were given to each foreman and through him to the men. Foremen got into the habit of figuring estimates on the cost of their work, and then trying to beat their own estimates. Some of the workmen would bring scales into the mill to weigh the material delivered to them, to make sure the storehouse was not beating them on the material charged against the job. The net result was the cutting in two of the maintenance material cost, with a saving of $20,000 a month." In Mr. Wolf's words: "Our men were well paid, better paid than those in any similar plant in the country, because they earned it. But the payment was entirely on a weekly and hourly basis." Men frequently said to him: "We don't like to be bribed to do a good job. We would like to have the privilege of doing a good job without being baited to do it." Similar plans carried out in a group of Canadian plants, had the hearty support of the union. John P. Burke, president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, says: "Four years ago I worked in the mill. I know what it is to go through the same deadening motions hour after hour and day after day. When that work was made interesting it was as much of a benefit to the workers as taking four hours off the workday.

When Mr. Wolf explained to the local union what he proposed to do, and when we were satisfied that he had no ulterior motives, we coöperated with him, because the labor movement believes in progress, not in stagnation." [4]

The plan of industrial coöperation inaugurated by the Colorado Fuel and Iron Co., at the close of the strike described in a previous chapter, was a compromise between the system of individual bargaining previously in force, and recognition of the miners' union, which the company had persistently refused. John D. Rockefeller, Jr. made a personal visit to Colorado, meeting the miners in their homes. He said to them: "They tell you that we are enemies. I have come here to tell you that we are not enemies, but partners. Labor and Capital are partners, not enemies. Neither one can get on without the other. Their interests are common, not antagonistic." The idea of Mr. King had been to devise some machinery which would not only prevent labor from being exploited, but secure the cordial coöperation which would further industrial efficiency. A system of representative government was worked out, with joint committees for each district, and for the industry as a whole. An Employees' Bill of Rights assured strict compliance with federal and state laws, the posting at each mine of the wage scale and working conditions, the right of assemblage, and of membership or non-membership without discrimination in any union. Grievances were to be investigated. An appeal could be taken to the officers of the company, and from these to the State Commission, whose findings were to be regarded as binding on both parties. The plan was submitted to the men, and adopted by a majority of 84 per cent of the votes cast. It is interesting to note that the constitution was printed in seven languages.[5]

[4] *Survey*, 44, 112, Apr. 17, 1920. See also Wolf's paper on *Non-Financial Incentives*, Am. Soc. of Mechan. Engineers, Dec., 1918.

[5] W. L. M. King, *Industry and Humanity*, 1918, 434 *ff.*; *Commis. on Indust. Rel's*, 1916, 9, 8449 *ff.*; J. D. Rockefeller, Jr., *The Colorado Indust. Plan*, 1916.

There can be no question that this plan was offered by the company in good faith, and represented a radical change in policy. Many of the worst evils were corrected. The mine foreman was shorn of some of his arbitrary power. Coöperation between the representatives of employers and employees secured a great improvement in conditions of labor and housing. The men, however, appear to have resented it as an attempt to forestall their own democratic plan of representation through the union. They took little interest in the elections, and made almost no use of the machinery for presenting grievances.[6] Those familiar with the situation were not surprised to learn of another strike in the Fall of 1921, following a 30 per cent reduction in wages. The statement of the company's counsel, on Nov. 17, is highly significant, in the light of previous history: "We will let the mines remain idle if the men go out until such time as they are ready to report back for work. The Colorado Fuel and Iron Company, contrary to current reports, will not import one strike breaker. If any need arises for protection of our property we will look to the State to provide it. We will not employ one additional watchman and we refuse to admit there will be any need for mine guards."

An associate of the C. F. and I. in the strike of 1913, the Victor American Fuel Co., was forced by labor conditions to reverse its attitude toward organized labor, and make a contract with the United Mine Workers. This Agreement will serve as well as any to illustrate the collective bargaining carried out for many years in a large section of American industry, by what Hoxie calls the "business type" of labor union. It covers 17 companies in Colorado, and 26 mines, for each of which the piece and times rates are minutely specified. "In the interest of good and efficient service," the contract reads, "the Union

[6] John A. Fitch, *Two Years of the Rockefeller Plan*, Survey, 39, 14, Oct. 6, 1917. See also comment by J. E. Williams, *id.*, 35, 145, Nov. 6, 1915.

agrees to promote and encourage a feeling of friendliness, coöperation and contentment at the mines of the Company in order that there shall be no violation of the contract; and to use all the power and influence of the Union, its National, District and Local Officers to see that not only the letter but the spirit of this contract shall be obeyed. Violations of the contract, such as have occurred in the past,[7] will not be tolerated, and those responsible for agitating violations or other trouble will be punished according to the provisions of the laws of the Union, the intention being that the mines of the Company may operate prosperously and without interruption at the highest possible production with competent industrious workmen." Simple machinery is provided for the adjustment of grievances, the base of the system being the Pit Committee and the Mine Foreman, and the apex an umpire selected by the Presidents of the company and of the United Mine Workers, whose decision is final. No strikes are allowed for any reason, members violating this rule having $2.00 per day deducted from their earnings. The company is to be fined for a lockout, at the rate of $2.00 per day for each employee affected. Any employee who absents himself from duty for two days or more, or who persists in working irregularly, forfeits his position. The company is to compensate any miner unjustly discharged. Other sections provide full regulations to cover such matters as timbering, docking, checkweighman, etc. The union dues are to be collected by the company, as a deduction from the pay roll. This standardizing of industrial relations is possible only with a strong and national Trade Union. Many employers prefer to negotiate with a union agent rather than with their own men, as he has a knowledge of the industry as a whole and is free from local bias.

The plan of Shop Committees or Works Councils, was given great impetus by the War Labor Board. Up to the

[7] This refers to the previous Agreement, renewed for two years on April 1, 1920.

middle of 1919, over 200 plants, with 500,000 workers, were known to have installed some form of employees' representation.[8] These ranged from mere discussion clubs, up to the representative government of the Filene store in Boston, or the Procter and Gamble Co., with the employees participating as stockholders and represented on the Board of Directors. The success of the movement has been equally various. Where honestly and carefully installed, with the approval of the workers themselves, the plan has tended to bring mutual understanding and harmony. It cannot safely be used as a substitute for the labor union, if the men strongly desire a union. In many cases remarkable results have been achieved, often in connection with some form of profit-sharing. I select an example which has been in operation for a decade.

In 1910, the Philadelphia Rapid Transit Co. was on the verge of collapse. No dividends had been paid for eight years. Equipment was in shocking condition, and service demoralized. Two recent strikes, resulting in rioting and bloodshed, had cost the company and the city millions of dollars, while the men had lost more than half a million in wages alone. Another strike was brewing. E. T. Stotesbury was persuaded to assume the direction of the company, as a civic duty, and money found for the purchase of modern cars. The new management took hold with the understanding that in five years' time it would provide the public with an adequate system of transportation, and the men with such increased wages and improved working conditions as coöperation might make possible: stockholders must wait for returns until these two questions had been disposed of. The plan of industrial relations was worked out by Thomas E. Mitten, chairman of the executive committee, on the basis of his previous experience in

[8] Nat. Indust. Conf. Board, *Works Councils in the U. S.*, 1919; New Jersey Bureau of State Research, *Shop Committees and Indust. Councils*, 1919; Wm. L. Stoddard, *The Shop Com.*, 1919; John Leitch, *Man to Man*, 1919; Ordway Tead and Henry C. Metcalf, *Personnel Administration*, 1920.

Chicago. Finding that about 22% of the gross passenger receipts were being used in the payment of wages and sick benefits, Mr. Mitten had this percentage set aside as a fund from which the men would receive their compensation. Any increase in receipts, due to larger cars and improved routing, or to greater promptness, honesty or courtesy on the part of the employees, would mean larger wages to the men. The actual disposition of this fund was put in the hands of the coöperative committee, made up of two motormen or conductors elected by secret ballot in each of the car barns, or divisions. These two representatives arranged the runs made from the barn, acted as a grievance committee for the men, and coöperated with the company in the matter of discipline. Once a month the committee met as a whole, the company being represented (without vote) by the division superintendents. Among the matters taken up were new routings and time-tables proposed by the company, the more important cases of grievance, the management of the coöperative benefit and purchasing plans operated by the men, and the wage scale which would be justified by the condition of the 22% fund. In carrying out the plan the company dealt with the men as individuals, divisions among the employees making it impossible for Mr. Mitten to deal directly with the union as he had done in Chicago. The understanding was that the latter plan would be followed whenever two-thirds of the men so voted.

Two strikes were attempted, but caused no serious interruption to service. The second, in 1918, was investigated by the War Labor Board, which dismissed the complaint. On the advice of this body, the 22% wage fund was abolished, in order to bring wages up to the current scale. Other modifications were made at this time. The coöperative plan was extended to all departments of the company, joint committees taking the place of the former committees of employees. In cases of controversy, representatives of employer and employees were to vote separately, by

secret ballot. Final settlement was vested in a Board of Arbitration.

The results of the Stotesbury-Mitten plan were very remarkable. In the first three years, resignations were reduced from 1,390 to 337, and dismissals from 1 in 5 to 1 in 20. The average wage of conductors and motormen was increased from 23 cents an hour in 1911 to 31 cents in 1916, 43 cents in July, 1918, and 58 cents in 1919. The gross earnings of the company increased 89%. The rate of fare for the public had not been raised. The average rides per capita in Philadelphia increased from 288 in 1910 to over 425 in 1919. In other words, an increase in wages of 150% had been matched by 120% increase in production. The number of accidents was cut in half. The employees developed into what Mr. Mitten has called "the most courteous, careful, and efficient body of motormen and conductors in America." Of a force of about 10,000, over 99% were members of the Coöperative Welfare Association, which furnished a blanket life insurance policy of $1,000 at a cost of $1.00 per month, in addition to sick benefits and pensions.[9]

In the Government Arsenals, the signing of the Armistice threatened a serious reduction of business and employment. Permission was given by the Secretary of War for the arsenals to bid on the peace-time requirements of the government departments, in competition with private concerns. The shop committees which had been already introduced, with the backing of the unions, began to take on new and interesting functions. When a proposal for a bid is received by an arsenal, "the employees' committeemen become immediately active. First, it is decided by the central committee whether its arsenal can manufacture the article upon which bids are sought. Manifestly it is to the employee's interest to get the work for his particular arsenal, since the tenure of his employment depends

[9] *Commiss. on Indust. Rel's*, 1916, 3, 2733 *ff; The Coöperative Plan* of the P. R. T., 1918; *Year Book*, 1919.

upon securing enough work to prevent further reduction in the arsenal force. The tendency of the commanding officer of the arsenal is naturally and properly toward conservatism; if the proposal is for work rather aside from the usual lines of manufacture in his arsenal, he inclines to play safe; that is, either not to bid, or to bid fairly high to avoid loss. The employees incline to bid low to get the work done and hold their jobs. The result actually reached is that the employees investigate with great care the possibilities of economic manufacture of the particular article being considered. The best men on each process which will be involved if the contract is secured are consulted, and, in effect, the combined experience and resourcefulness of the employees is massed on the problem. Repeatedly the estimates of the employees on labor costs have been so low as to give pause to the commanding officer and the planning department, which advises him. The employees then are put in the position of definite responsibility for their own estimates of the performance which they can deliver. They virtually guarantee the estimates as to direct labor costs—in fact, in at least one instance the employees were required by the ordinance officer in charge of the shop to guarantee in writing to meet an estimate which they had made and which he believed to be too low. Not an instance has occurred thus far in which the employees have not held labor cost below their estimate." With the change in function of the workers' organization, has come a change in the character of the union leadership, good fighters giving place to men with ability as productive workmen.[10]

In September, 1910, a Protocol or treaty of peace was signed in the Ladies' Garment Industry in New York City, after many years of warfare and a general strike of unusual bitterness. The contracting parties were the Cloak, Suit and Skirt Manufacturers' Protective Association, and certain locals of the International Ladies' Gar-

[10] *Industrial Democ. at Rock Island,* Nation, Sept. 13, 1919.

ment Workers' Union. As the union had insisted on a closed shop and the employers on an open shop, Mr. Brandeis' suggestion of a preferential shop was made the basis of compromise. Under this arrangement, "the employer is bound to maintain union standards as to hours, etc., and to give the preference in employing and retaining help to union members. On their side the unions are bound to maintain discipline in the shop among their members, to restrain them from breaches of contract and unauthorized strikes, and to see that they live up to the conditions of the Protocol; in other words, in return for the preference shown them, the unions assume full responsibility for the conduct of their members." [11] Subcontracting within the shop and the taking of work home were forbidden, thus doing away with the sweatshop and the tenement worker. Minor abuses in shop practice were corrected, a minimum wage-scale established, and a 50-hour week. Strikes and lockouts were prohibited during the life of the treaty, for which there was no time limit.

Three joint bodies were set up by the Protocol. The Board of Sanitary Control was to establish standards for the industry. Because of the character of its personnel, and the efficiency of the director, Dr. Geo. M. Price, its work was remarkably efficient. A systematic inspection of the 1,243 shops in New York City, showed that about two-thirds were defective either in sanitation, fire protection, or both. At the end of six months, only 54 of these remained unimproved. Under the terms of the agreement, no member of the union would work in a shop declared unsanitary, and no manufacturer would give out work for this shop to do. The erring employer either complied with the recommendations of the Board, or was forced out of business. Twenty-seven such "sanitary strikes" occurred within the first year. Thus both the worker and the em-

[11] Chas. H. Winslow, Bur. of Labor Statistics, *Bull. 98*, 1912, 203. See also *Bull's 144* and *145*, 1914; *Monthly Review*, Dec., 1917, 19; Julius H. Cohen, *Law and Order in Industry*, 1916.

ployer were protected against the cut-throat competition of unscrupulous firms.

The Board of Arbitration, made up of such distinguished names as Louis D. Brandeis, Hamilton Holt and Morris Hillquit, acted as a court of appeal, chiefly confining itself, however, to differences which arose between the manufacturers' association and the union. The Board of Grievances, consisting of five members from each side, served as a trade court. Of the 1,004 cases adjusted in the first year, 798 were settled by the deputy clerks, acting as a joint mediation committee, 202 by the Board itself, and 4 appealed to the Board of Arbitration.

The weakness of the system, as events proved, lay in the bi-partisan character of the trade court, and the lack of any body of law on which to base its decisions. The machinery broke down after five years, ostensibly on the issue of the employer's right to discharge competent union workmen, but actually because of impatience on both sides with the moderate progress made in raising business standards and conditions.

The attempt to introduce a constitution into the industry was not lost. Collective bargaining continued in the Cloak and Suit trade, under various forms of agreement. The Protocol idea had been adopted by other branches of the Ladies' Garment industry, in most of which it is still in force. Robert W. Bruère, who acted on the Board of Arbitration in the Waist and Dress group, has given interesting testimony as to the effect of industrial parliaments. Discussion, and adjustment on the basis of evidence, was substituted for strikes and lockouts, which until a few years ago kept the largest of our clothing industries in a state of perpetual turmoil. "I have seen employers and workers come together in the meetings of wage boards, tense with bitterness and hostility. I have heard them wrangle for hours over charges of bad faith and have seen them grow calm and reasonable as the questioning of the chairman brought out the facts on both sides and de-

veloped the basis for an understanding. Often both sides will show an unexpected readiness to subordinate what they had considered their absolute rights in the premises to the larger interests of the industry, and to recognize themselves and one another, not so much as enemies fighting for a stake, but as industrial citizens with a common interest in the prosperity of the trade and a common responsibility to the public." [12]

A parallel movement took place in the Men's Garment trade. It began with the Hart, Schaffner and Marx agreement, which has had a continuous life since February, 1911, with modifications and improvements, but without any serious break. The plan has since been adopted by other shops, and by clothing centers outside of Chicago.[13] This firm, which employs about 6,500 workers, is now governed by the principle of the preferential union shop, a large proportion of the employees being members of the union. Each floor of their factories, containing from 100 to 200 workers, has a shop chairman, elected by the union members. He is recognized as an officer of the union, in charge of complaints and organization matters within the shop. Complaints are first taken up by the shop chairman with the foreman or superintendent. If no satisfaction is obtained, the case is reported to the union, which employs four deputies, or business agents, one for each trade (coats, vests, trousers and cutting.) The proper deputy, after making an investigation, takes up the matter with the firm's labor manager, a university professor trained in Economics and given very broad powers. He is in charge of Health and Safety, Education, Employment, Discipline, and Wages and Rate Setting. He acts as the diplomatic agent of the firm in all matters involving the labor force. Rates for piece work are set by a committee of

[12] *Meaning of the Minimum Wage*, Harpers Mag., 132, 282, Jan., 1916.

[13] Bur. of Labor Statistics, *Bull. 198*, 1916; New Jersey Bur. of State Research, *Shop Com's and Indust. Councils*, July, 1919, pp. 28, 34, 52.

three, one representing each side and a third member whom they select. Cases where the piece-rate committee, or the deputy and labor manager, fail to agree, are carried to the Trade Board of the Chicago clothing industry. This Board consists of an impartial chairman, and of five representatives of each side, who practically argue the case before him. The impartial chairman, paid jointly by the manufacturers and the union, is a man of the highest character, chosen for his business acumen and diplomatic skill. The firm's records as to costs, profits, etc., are placed at his disposal, and his decisions are usually final. A Board of Arbitration is added, for questions involving the interpretation of the agreement. Back of the entire plan, on paper and in practice, is the idea of coöperation in production, and a community of interest.

By the middle of 1919, this form of collective bargaining had come to include practically the entire industry. A national agreement between the manufacturers' association and the Amalgamated Clothing Workers was in prospect. Makers of high-grade clothing found the stabilizing of labor and improvement of working conditions a great advantage. But the small amount of capital required in the business, the growth of subcontracting, and the supply of immigrant workers available in normal times, make it difficult for either the employers or the union to control the smaller shops. Conditions in the New York market have been particularly chaotic.

The unions in the needle trades, which we have been describing, are organized on industrial rather than craft lines. They are extremely democratic, and characterized by Socialism of a radical but idealistic type. They form, as has been said, "a spiritual brotherhood, based upon a common aspiration."[14] Their attitude towards the clothing industry is that of future proprietors, rather than mere hired men. Efficiency methods, for example, at which the old unionist looks askance, are cordially accepted.

[14] J. M. Budish and Geo. Soule, *The New Unionism*, 1920, 157.

Their remarkable educational program aims at a broad culture and the mental emancipation of the working class, so that they may be made ready to assume control of production. As one observer has said: "The chief struggle of the far-sighted leadership among the Amalgamated Clothing Workers is to keep in line the impatient extremists who are not satisfied with steady growth, but want the millennium by tomorrow afternoon." [15] What interests us here is the view of the new unionism that industry, even in its present stage, is a form of community service. The convention of 1920 put itself in line with the old-time craftsmen by declaring for definite standards of production, in connection with the policy of payment by the week rather than by the piece. In the course of the debate, Pres. Sidney Hillman, who might be termed the father both of the Hart, Schaffner and Marx agreement and of the Amalgamated Clothing Workers, said: "For myself, I do not think that our union can adopt the ordinary rule of commerce, the principle of the business man, which is to give as little as possible and to take as much as possible. We must have a different attitude toward the industry. We must accept responsibility for production. We cannot have sabotage by withholding production: we cannot have loafing; we must have production and we must recognize our responsibility." [16] In the agreement drawn up between four silk ribbon manufacturers in New York, and weavers affiliated with the new Amalgamated Textile Workers, which grew out of the second Lawrence strike, we find this statement: "Public interest requires increasing production as a prime factor in reducing commodity prices. Wages, hours and working conditions should be regulated by this requirement." [17]

All of these plans for coöperation in American industry are confessedly experimental. Most of them have yet to

[15] Baker, *New Industrial Unrest*, 1920, 197.
[16] *Survey*, 44, 275, May 22, 1920.
[17] *Id.*, 44, 233, May 15, 1920.

be tested in a period of labor surplus and decreasing wages. The factor of personal temperament and prejudice enters, as in all human relations. "Employee representation," as the Industrial Conference said, "offers no royal road to industrial peace." But the movement outlined in this chapter shows that goodwill is as important an element in Industry as we have seen it to be in Trade. As Commons puts it: "The laborer is not only a productive machine, he is a customer. The employer is not only buying his time or his product, but is also selling to him a job where he can earn a living. The employer makes a certain investment on behalf of every customer and every employee. He furnishes something in exchange, and he not only wants that customer or worker to return, satisfied with his treatment, but also to spread the word and bring others. Goodwill is good reputation, and reputation is the collective opinion of those whose patronage is desired. . . . So industrial goodwill is a valuable asset like commercial goodwill and good credit, and becomes so, more and more, in proportion as laborers acquire more liberty, power, intelligence and more inclination to assert their liberties. It too is valuable because it brings larger profits and lifts the employer somewhat above the level of competing employers by giving him a more productive labor force than theirs in proportion to the wages paid. And this larger profit reflects itself in the larger value of stocks and bonds, the higher capitalization of the going business." [18]

What the future will bring in the way of economic and social reorganization, we do not know. All our theories and programs are tentative and must be continually revised. Fortunately I am not called on in this book to attempt the ambitious and dangerous work of prediction. Nor have I attempted to settle any specific industrial problems. I have a keen personal interest in these problems and their solution. But our attitude, as I stated at the beginning of this Section, is the open-mindedness of the

[18] John R. Commons, *Industrial Goodwill*, 1919, 18, 26.

scientific investigator, rather than the opportunism of the judge, who is obliged to render a decision on every question, whether the evidence is ample or not.

Our concern is with the nature of the Universe in which we live, and the conditions of successful adjustment. The idea I have tried to bring out is that the fundamental problem of Industry is the problem of human behavior. We are dealing with men and women, whose conduct is very largely determined by certain inherited instincts as motives of action. No solution can be final which fails to give these instincts full expression.

"We hear much," says Tead, "of 'humanizing' our industrial system. What is involved in this is nothing more nor less than a discovery of personalities, a knowledge of their human natures, and an effort to give those natures a chance. . . . The individual is now seen as a compact of ascertainable impulses, who acts as he does because known forces, external and internal, are at work to influence his behavior. . . . The conduct of groups in industry, like that of individuals, is also to be more readily understood when we know even a little about the moving energies out of which it proceeds. This means of course, that a change in causes will bring a change in effects. And experience shows that this is true. . . . Conduct, if subject to law, can be controlled if we can control its causes. Human nature will respond in varying ways to varying stimuli, and if we supply a stimulus which is calculated to evoke only the more socially beneficent impulses of human beings (assuming that we know which these are), we can rely upon the desired reactions taking place." [19]

If the Universe lays down certain laws of human behavior, certain conditions of action and reaction, the leaders of Management and Labor may be expected, after long and painful experimenting, to learn those laws and conditions, and adjust their action accordingly. That, I believe, is what we are witnessing in many parts of the industrial

[19] Ordway Tead, *Instincts in Industry*, 1918, 215 *ff.*

world, at home and abroad. The corporation or the labor group which follows the principles of justice, goodwill and mutual service, has attained a survival value. It is giving free play to natural motives of conduct, opening channels for instincts which, if repressed, become abnormal, dangerous and expensive. A process of natural selection, aided by group responsibility and public supervision, will tend to force other groups into line. Coöperation in industry is selfishness and something more. It is self-interest raised to the plane of common interest.

Recent industrial history thus confirms in a striking way the principles which Jesus lays down as to the nature of the Universe. Obedience to the laws determined by the moral and altruistic character of God, means an orderly and increasingly fruitful advance, which will preserve in the new order the best of the present order. Production may be expected to increase, both in quantity and quality. Human instincts, instead of being thwarted or misdirected, will be given free scope. But the attainment of this end will require sounder knowledge of human behavior and a higher moral leadership than either the capitalist or the labor group as a whole has thus far shown.

One possible objection may be made to my interpretation of the facts. I refer to profiteering, or making money out of monopoly or special privilege. This has always been present in any industrial order of which we have knowledge; it has been common throughout the modern era, and especially rampant during the War period. But that such action is not normal to the Universe, is shown by the absurdity of imagining every person a profiteer. Fair dealing, the return of a full value of service to the purchaser, has come to be, like justice and honesty, a community standard. It is the base-line of our industrial life. One of the aims of Society, in the interest of its economic health, has been the curtailment of extrinsic or unearned advantage, and the equalizing of opportunity. In any sphere, shrewdness and application will bring results, as

in the cases already cited of the "bad" mechanic or the cruel general.[20] The profiteer in the ranks of Capital or Labor may have reached his immediate objective: easy money. But in doing so he has come perilously near to wrecking the whole industrial machine. And he has been in danger, as Jesus says, of losing his own soul. Such a course of procedure can hardly be called success, from a cosmic standpoint.

[20] See *ante* p. 144.

PART III.

THE MORALITY OF THE UNIVERSE.

Section 3. National Relations.

XX.

NATIONAL AGGRESSION.

We now pass to the field of national relations, which will occupy us during the remainder of our book. Is there any evidence that justice and goodwill bring the same reflex advantage, as in personal and industrial life? In other words, must national groups follow the laws of a moral and altruistic Universe? Is the Christian God a Partner who needs to be reckoned with in international affairs?

We may dismiss, at the outset, the idea that God has been directing human history, as Lloyd George directs the British Empire, or Judge Gary directs the Steel Trust. If this were true, if God could be held responsible for the course of our political life from the beginning, He would be either impotent or immoral. But for such Super-management there is absolutely no evidence. This is not to deny that God is a Person, sharing in human struggles and interested in their outcome. The whole problem of Personality has been excluded from the present book. On any theology, we find man and the Universe coöperating. What we may expect to find, as in Organic Evolution, in Culture, Providence or Industry, is a wide experimenting, a limited *laissez faire*. Nations, like individuals, are in daily contact with the Divine activity. In order to survive, they

must adjust themselves to a Universe of definite character. The conditions of survival, if we can determine them, will throw added light on what that character is.

Two contrasting theories of national relations are before us. According to Jesus' principle the strength of a nation, in its dealings with other nations or with subject peoples, depends on fair dealing and the development of common interest and mutual service. The theory generally current is the exact opposite of this. Assuming a competition of selfish interests, it asserts or implies that national advantage is due to self-seeking, mastery and exploitation.

We find a natural center for discussion in the history of modern Germany, from Bismarck's masterful but unscrupulous attacks on Denmark, Austria and France, by which he laid the foundations for a strong Empire under Prussian leadership, to the later development of "the will to power" which resulted in the World War. In studying the policy of force and aggression, in this extreme form, let us examine its supposed biological basis, its theory of the State, and its practical consequences.

By one of the ironies of history, two very peaceful and amiable English philosophers were responsible for the recent conflict. The economic and political thought of modern Germany had been nourished on the idea of struggle emphasized by Malthus and Darwin. Nowhere had the cult of Natural Selection gained a stronger hold.

Population, according to this theory, tended to increase faster than the means of subsistence. In the resulting struggle, the stronger crushed the weaker. The field was left in possession of those who were fitted to survive. It was on this law of Nature that progress depended. It applied to nations as well as to individuals and species. Self-defense required Germany to extend her power through the world, by force and without scruple. Otherwise there would be no assured market for the Empire's expanding trade, no outlet for her surplus population. Her progress

would be ended, her world mission cut short. She would sink to the position of a second-rate and stationary nation. Believed with startling unanimity, not only by the governing classes, but by the German people as a whole, and to a less but still significant degree by the statesmen and political philosophers of other countries, the doctrine called for war, and there was war.

The pathetic feature of the situation was that the teachings of Malthus and Darwin are not true. Their authority was no longer accepted by progressive scientists, even in the land of their birth. Germany heroically committed suicide for economic and biological doctrines that were as out of date as scarlet uniforms or smoky powder.

The Malthusian theory of population never was universally accepted by economists, and does not seem to fit the facts of modern history. It has broken down at both ends. With the advance of civilized people in standards of living, and especially of comfort, the population does not tend to increase in a geometrical ratio. The birth-rate in Germany was decreasing, and more rapidly than that of Britain or France. On the other hand, with the progress in agricultural science and the opening up of new lands, the food supply of the world has increased very much faster than Malthus supposed possible. Thus the increase of population in any country is either absorbed by industrial enterprises, or distributed through emigration to countries where the factory system has created a demand for labor. In no developed civilization, in 1914, with the possible exception of Japan, was there a real pressure of population on subsistence. Germany, for two and a half decades before the War, had so far absorbed her increase, that emigration averaged under 30,000 a year. In 1913, although the excess of births over deaths was 879,113, only 25,843 people left the country. In fact Germany was short of labor. Not only were the estates of East Prussia largely cultivated by Russian Poles, of whom many thousands were brought across the border during the summer season,

but she was using Slavs and Italians in her mines and other industries.[1]

As pointed out in an earlier chapter,[2] Darwin's theory of progress through natural selection has been rejected by the newer school of Biology. Bitter struggle for existence is not necessary, even in wild Nature. In the words of T. H. Morgan, "If we suppose that new mutations . . . appear, some of which will find an environment to which they are more or less well fitted, we can see how evolution may have gone on without assuming new species to have been formed through a process of competition." [3] If the doctrine of progress through struggle has lost its standing in Biology, it can no longer be used as a basis for political theory and practice.

From the supposed biological basis of the competition theory, I turn to the political doctrine underlying it. Briefly stated, individuals exist in and for the State, and are benefited in proportion to the strength of the State, in a military sense. As Kuno Francke has expressed the German ideal: "By summoning all her powers—physical, intellectual, spiritual—against the ruin threatened by foreign dominion, Germany, under Prussian leadership, once more rose to political greatness. A new and exalted conception of the State,—a State uniting in itself all ideal aspirations of the people, making national progress, culture and achievement the supreme goal of individual exertion—inspired the best Germans throughout the nineteenth century and finally led to the founding of the new Empire and to the recent epoch of German prominence among the nations of Europe." [4]

The foundations of German political and economic theory were laid by Friedrich List, in his *National System*

[1] The prospect of a check to Germany's industrial development, sufficiently serious to renew the emigration of earlier years, was due, as we shall see, to the nation's adoption of the doctrine of ruthless struggle. It is a case of the theory devouring the theorist.

[2] *Ante*, p. 54.

[3] *Evolution and Adaptation*, 1903, 464.

[4] *The German Spirit*, 1916, 95.

of Political Economy, published in 1841. In opposition to Adam Smith's free trade doctrines, List advocated the full development of Germany's productive powers, under a system of protective tariffs which would make the nation self-sufficient. This policy was followed more or less consistently, after the political revolution of 1878. Many other factors contributed to subordinate the individual to the State: the habit of obedience to authority among the German people, the metaphysical and mystical character of German thinking, the hegemony of Prussia, with its absolutist traditions and its ruling Junker caste, the personal character and ambitions of William II. Universal military service, which had been adopted by Prussia as early as 1808, trained the population to obey. The school system was made to serve the same purpose, both in direct instruction, and in its system of vocational training, by which each person was educated for the special position he was to occupy in life. The German, however humble his calling, was taught to feel the duty and responsibility of making Germany strong. He found patriotic compensations in the self-abnegation which would help to bring *Deutschland über alles.* There were rifts in the political structure. But hitherto Socialistic independence had been bought off by paternal social legislation. And the Marxian idea of the State is on the same plane with that of the Pan-German.

A political theory may be tested in two ways, either logically or pragmatically. We may take it, in the first place, as an induction from the facts of experience. By this test, the doctrine of the supremacy of the State must appear to us anachronistic. It is a survival, in the modern industrial and commercial era, of the absolutist ideas of mediæval Europe, which in turn were an outgrowth of the patriarchal organization of society. With the growth of popular government, following the French Revolution, the State came to be regarded as existing for the individual. The primary function of government, in democratic and

industrial countries, has been to encourage individual enterprise and protect individual interests. Outside of Germany and similar dynastic nations, a consistent doctrine of the authority of the State would not have been thought of, nor is it readily comprehended.

According to the pragmatic test, any political theory is true if it works well in practice. This brings us to the practical results of the competition theory, which I am about to discuss. Let me call attention to the fact that, in the form of economic nationalism, this general idea of the State is widely current. It may be stated in this way. While individuals do not exist for the sake of the State, they are benefited economically in proportion to the strength of the State, in a military sense. This idea finds embodiment, not only in strong armies and navies, but in preferential tariffs and subsidized industries. It is the key-note of both French and British Imperialism, and of Admiral Mahan's thesis of the importance of sea power in history.

Turning to the practical consequences of the competition theory of national relations, I do not lay any great stress on the fact that the German plan of world conquest met military defeat. Even a military victory, which at times seemed possible, would have been largely illusory. The extreme Pan-Germans were ready to take a gambler's chance, and risk the ruin of the Empire for the old dream of world dominion. But the looting of commercial cities is no longer a profitable enterprise. Modern wealth is not portable to any large extent. The carrying off of Belgian machinery merely impoverished a region which it was planned to annex to Germany. As the other horn of the dilemma, if they had not carried it off they would have been annexing competitors to German industry, within her tariff wall.

Veblen has called attention to the fact that the predatory nations of history were essentially parasitic. Powerful adventurers fastened themselves on a superior civiliza-

tion, and used its resources for further conquest. When the wealth of the subject civilization was sucked out, the empire or principality collapsed. The slightest reading of history, ancient or modern, will cause one to question the value of wars of aggression, from an economic standpoint. France recovered more rapidly than Germany after 1870, in spite of, and many students say because of, the large indemnity she was forced to pay. Five years after the defeat of Russia by Japan, by which a policy of military and territorial aggression was ended for the former and begun for the latter, the Russian budget showed a surplus for the first time in twenty years, while the Japanese were paying 30 per cent of their net income in taxation.[5]

Nor need we lay emphasis on the failure of the German policy of ruthlessness. Instead of terrorizing the European world into submission, it had exactly the opposite effect. It gave the Allies a basis on which to appeal to moral indignation, and so clothed their side of the conflict with an ethical and religious sanction. The reason I do not use ruthlessness and its natural reaction as an argument at this point, is that a policy of national preparedness and aggression may be carried on without it. The competition theory may be played in sportsmanlike fashion, according to the recognized rules of the game.

Nor shall I enter into a sentimental discussion of the futility of war. The enormous waste of treasure and life, the dislocation of the normal activities of Society, the physical and moral deterioration of the nations taking part in it—all these have weight. They appear to put the burden of proof on those who claim that a state of war is normal to the Universe, and a reflection of its character, or rather lack of character. War cannot, any more than the duel, decide the ethics of a quarrel. The most

[5] Norman Angell, *The Great Illusion*, 4th ed., 1913, 85 *ff.* The Portsmouth treaty, however, gave Japan a definite economic advantage in the form of fishing rights on the Russian coast.

stand-pat historian would hardly claim that the average war in history has been won by the side which was in the right. The attempt of each nation to insure itself against war by being better prepared for war than any other nation, is a logical absurdity. But still the competition theory holds the field. One of the outstanding features of the World War was the futility of the sentimental campaign against militarism. It was defeated, partly because of the revival of nationalism under the stress of acute situations and aroused passions, partly because of general belief in the competition theory as a practical doctrine. As long as national governments, and the public sentiment that lies back of them, believe that there is an advantage in military strength, just so long will the theory survive. The popular response awakened by the Disarmament Conference suggests that public opinion is changing front, as a result of recent experience. If war ever disappears, it will be because men generally have discovered that it does not pay. Which brings us to the crux of our problem. We must learn whether competition, in the military sense, is profitable, normal, and characteristic of the Universe.

As a historical generalization, we may say that the advances in civilization and general well-being have been due to peace rather than to war.[6] Modern industry, and the commerce through which it finds an outlet, has been built up on peaceful intercourse and relative freedom of trade. An apparent exception is found in the stimulus which war gives to national energy, particularly along the lines of invention and production. The Allies were able to carry on the contest for over four years, without any apparent diminution of wealth, in spite of the number of persons withdrawn entirely from production or diverted to the production of purely military material. But the increase in the production of essentials, by which these losses were made good, was not due to war, except in an

[6] *Cf.* Thorstein Veblen, *Instinct of Workmanship*, 1915.

indirect sense. It was due to the better organization of industry, to the increased output induced by the motive of patriotism, and to the cutting off of non-essential production and the postponement of all but the most necessary consumption. There is no reason why these or similar causes should not become generally operative in time of peace. All that the war experience teaches, is that we have a large productive capacity in reserve. How to tap this reserve is the principal problem of Industry.[7]

When we examine closely the case of pre-War Germany, as an example of the competition theory consistently applied, we find that it aroused unfavorable reactions in other nations, imposed a heavy financial burden, and was heading the nation toward economic disaster, in spite of her apparent strength. Let me take up these points in order.

When Germany, after the war of 1870, took Alsace-Lorraine from France, she gained a more easily defended frontier, and a rich territory, much richer in fact than she had supposed, when improved technical methods made it possible to use the Lorraine iron ores in the making of steel. The price she paid was the permanent enmity of France. Not only was the thought of revenge, the idea of recovering the lost provinces, a constant dream of the French people. But suspicion of her powerful new neighbor and the dread of fresh aggression led France to build up a powerful military machine, to match that of the Germans. As further means of protection, France laid aside her hereditary hostility toward England, and made with Russia a military and financial alliance. The net result was the competition in armaments, which laid an increasing burden on the nations of Europe, and created a tense situation where a false step would make peace impossible.

The unfavorable reaction of England toward Germany is somewhat more complicated. It appears to have begun

[7] *Cf.* David Friday, *Profits, Wages and Prices*, 1920.

with Bismarck's sudden annexation of territory in Southwest Africa, in 1884. Other colonial acquisitions followed, and it was clear that Germany had entered the race as a world Power. The growth of German trade aroused considerable jealousy on the part of British merchants, who found their new rivals underselling them in their natural markets. With the building up of the German navy as a formidable fighting force, the British people as a whole became fearful and suspicious. A competition in battle fleets was added to the competition in armies. That England was frequently the aggressor in the struggle for territory and trade, is undoubtedly true; I shall give some examples of this in a later chapter. But the course of German diplomacy was such as to create the feeling that Germany was a dangerous and unscrupulous rival, whose continued expansion might threaten England's very existence. Englishmen could not forget, for instance, Germany's threatened interference during the Boer War, when the British Empire was passing through a serious crisis.

The reaction of other nations was more than the fear of military aggression, for which the utterances of the extreme Pan-Germans gave some foundation. Germany's methods of commercial and financial penetration aroused equal resentment and fear. Recent German emigrants were still counted as German citizens, and used as commercial and political propagandists, even if they had become naturalized abroad. German-controlled banks acquired a powerful and sometimes a dominant influence in other countries.[8] Long-term credits, running often to a year or 18 months, captured the South American trade. Imitations of standard foreign goods were sold at a lower price, sometimes through a third country to conceal their real origin. Industrial and commercial espionage was reduced to a fine art. By selling abroad at a lower price than

[8] See G. Preziosi's story of the Trojan horse in *La Germania alla conquista dell' Italia,* 1915.

at home, it was possible to destroy competition, and secure a monopoly of many lines of business. This practice is known as dumping. Steel girders, for instance, which sold for 130 marks in Germany, were sold at 120 to 125 marks in Switzerland, and 103 to 110 marks in England. In Italy, in an attempt to throttle the new iron industry, they were sold at 75 marks, or from 10 to 20 marks below the actual cost of production, until a working agreement was concluded with the Italian steel trust, in the Spring of 1913.[9] Finally, the prestige of the Empire was used to advance trade. The German navy was a powerful business lever. Prince Henry and the Kaiser went on the road in person. Loans were made to backward nations in return for concessions and orders for goods.

As to the climax, one of the best statements I have found is that of Count Czernin, the Austro-Hungarian statesman. "The war would never have broken out had it not been that the growing suspicion of the Entente as to Germany's plans had already brought the situation to the boiling-point. The spirit and demeanor of Germany, the speeches of the Emperor William, the behavior of Prussians throughout the world—whether in the case of a general at Potsdam or a *commis voyageur* out in East Africa —these Prussian manners inflicting themselves upon the world, the ceaseless boasting of their own power and the clattering of swords, roused throughout the whole world a feeling of antipathy and alarm, and effected that moral coalition against Germany which in this war has found such terrible practical expression. On the other hand, I am fairly convinced that German, or rather Prussian, tendencies have been misunderstood by the world, and that the leading German statesmen never had any intention of acquiring world-dominion. They wished to retain Germany's place in the sun, her rank among the first Powers

[9] Preziosi, *op cit.*, 61; Henri Hauser, Univ. of Dijon, *Les méthodes allemandes d'expansion economique*, 3me ed., 1916, Eng. Trans. (*Germany's Commercial Grip on the World*, 1917), 108.

of the world; it was undoubtedly her right, but the real and alleged continuous German provocation and the ever-growing fears of the Entente in consequence created just that fatal competition in armaments and that coalition policy which burst like a terrible thunderstorm into war."[10] Some points in this statement may be open to question. But it undoubtedly expresses the form of reaction which German *Realpolitik*, German arrogance and German commercial methods had brought out in the rest of the world.

Let us turn to the cost of national competition. In 1913, the last year of the pre-War period, the German people spent $342,304,875 for their army, $120,063,475 for their navy, $35,635,525 for military pensions, and $60,693,500 interest on the national debt, for which preparedness was chiefly responsible.[11] The direct cost of the military competition theory may therefore be estimated at $558,967,375 annually. This was $8.28 for each man, woman and child, or $41.40 for a family of five. As the Imperial funds were raised through customs, excise, profits on State railways, etc., the burden was probably distributed somewhat widely among the population. In addition to this, military service took 880,003 men out of the ranks of productive labor. This loss was not counterbalanced, as in the War period, by a patriotic stimulus to production. Estimating the number of households at 14,920,559, every 16 households were obliged to make up the production of a household from which a soldier or sailor had been taken, or an additional burden of $31.25 on incomes of $500 a year. When local taxes are added, the government was probably absorbing over a fifth of the productive power of the average working class family. The cost of preparedness was constantly on the increase.

[10] Ottokar Czernin, *In the World War*, 1920, 3.

[11] I have gleaned these figures from the *Statistisches Jahrbuch f. d. Deutsche Reich*, 1914. The mark is reckoned for convenience and old times' sake at $ .25. Population figures have been increased by 4% to allow for 3 years' growth since the census of December, 1910.

France and Britain carried a very much larger per capita charge than Germany.

Even the figures which I have given seem small by comparison with the post-War period. As preparedness was expected by the Germans to lead to war, sooner or later, it would be fair to enter the War as a charge against the competition theory. Recent experience has shown that the cost of modern wars must be borne by the participants, and cannot be shifted from the victor to the vanquished. The Allies, for economic reasons, have been unable to assess Germany even the full amount of damage done by her to their own territory. Outside the reparation debt, the direct cost of the War to Germany is estimated by Bogart at $37,775,000,000, or $559 for each unit of population, using the pre-War figures, with an indirect cost of about 20 billion more.[12] He gives the following totals for all countries participating in the most expensive debauch known to history.

Total direct costs, net		$186,333,637,097
Indirect costs:		
Capitalized value of human life:		
Soldiers	$33,551,276,280	
Civilians	33,551,276,280	
Property losses:		
On land	29,960,000,000	
Shipping and cargo	6,800,000,000	
Loss of production	45,000,000,000	
War relief	1,000,000,000	
Loss to neutrals	1,750,000,000	
Total indirect costs	$151,612,542,560	151,612,542,560
Grand total		$337,946,179,657

It remains to consider the economic position of Germany at the outbreak of the War. In spite of the heavy

[12] Ernest L. Bogart, *Direct and Indirect Costs of the Great World War*, 1919.

military burden piled upon her people, and her somewhat limited natural resources, the Empire had been able to forge her way to the front rank as a commercial nation. In 1913, her regular exports totalled $2,722,800,000, second only to those of Britain. In iron and steel, as in many special lines of manufacture, she had already passed England. The causes lying back of this remarkable achievement have been given by many writers, and need not be repeated here.[13] Most of them are entirely creditable, and would have brought success to any nation under any system. The question which puzzled the world in 1914 was this. Why, with such a growing command of world markets, and so many foreign business interests at stake, did leading German business men not only acquiesce in but apparently encourage the War?

It may be many years before we obtain a complete answer to this question. But it is the opinion of a number of careful students that the German leaders were conscious of a weakness in their apparently strong economic position, which could be covered or counterbalanced only by a victorious war.

As already stated, the general policy followed by the German Empire had been that of economic nationalism. Industrial development was largely directed by the government, along lines that would make the nation a powerful military machine. The railway system was laid out on strategic lines, often with no expectation of their cost being paid by peaceful traffic. Merchant shipping was subsidized, and adapted to the use of the navy. "Tariff legislation has been devised to so distribute and specialize the industry of the country as to make it a self-contained productive organization, in so far as concerns the military and

[13] See, for example, Earl D. Howard, *Cause and Extent of the Recent Indust. Prog. of Germany*, 1907; Arthur Shadwell, *Industrial Efficiency*, 2nd ed., 1909; Paul P. Gourvitch, *How Germany Does Business*, 1917; Wm. H. Dawson, *Evol. of Modern Germany*, 3rd ed., 1911.

other needs of the community in times of war." [14] Since the support of the "Junker" land-holders was necessary to the government, this class was favored by export rebates on agricultural produce.

With the growth of industry under a protectionist system, came a great increase of wealth and power in the commercial classes. It is now fairly clear, I think, that the pre-War policies of the German government were dictated not only by the military but by the commercial group. In fact, the two had become closely allied, as Millioud points out.[15] The military power of Germany was being used, not so much for its own sake, as for forcing trade openings and treaty concessions. The government, through its control of the railway system, its granting of differential rates and export rebates, and its diversion to German steamship lines of the emigration from Eastern Europe, took a leading part in the promotion of over-seas trade.[16] The investigation of the syndicates (Cartels) in 1903, only led to the encouragement of dumping as a settled policy of the Empire, whatever it might cost the home consumer. The conquest of the world through trade was planned with the same care as the perfecting of the military machine.

Germany's commercial position in 1914, however, showed weakness in three directions. In the first place, the extremely favorable trade treaties with Russia and other countries, negotiated by von Bülow, would expire in 1917. Unless some radical improvement appeared in her political position, she could not expect to extort equally favorable concessions.

In the second place, the protectionist policy, which made

[14] Thorstein Veblen, *Imperial Germany and the Industrial Revolution*, 1915, 207.

[15] Prof. M. Millioud, Lausanne, *La caste dominante allemande*, 1916. The Eng. trans. bears the title, *The Ruling Caste and Frenzied Finance in Germany*.

[16] Hauser, *op. cit.*, 138, and chap's 2-4.

it possible to dump manufactures on foreign countries, and drive competitors from the field, was beginning to react on the home country. Prices and living costs in Germany were constantly rising, and much more rapidly than in France or Britain.[17] This led to increasing discontent among the working classes. Wages were increasing, and capital becoming dearer, which meant a higher cost of production. To sell wrought goods abroad, it was necessary to buy other wrought goods or raw materials, including food. This balance of trade was increasingly difficult to maintain. In the five years from 1909 to 1913, while regular exports increased $875,575,000, corresponding imports increased only $560,850,000. For the latter year, the increases were respectively $284,925,000 and $19,425,000, and the balance of imports over visible exports only $168,450,000, as contrasted with $483,175,000 in 1909. At the same time, other countries, with their developing industries, were becoming serious competitors in the foreign market. The United States had begun to export manufactured goods, instead of buying them abroad in return for foodstuffs. England and France were taking leaves out of Germany's book. Not only were they copying her efficiency methods in their industries, but they had learned to make loans to other countries conditional on trade orders. Canada had already adopted an anti-dumping tariff, and other nations were likely to follow suit. Veblen points out that in a relative sense Germany was actually losing instead of gaining, the turning point in German industry and commerce coming about 1909.[18]

The third weakness was inflation. The German banking system had become highly centralized, with the government *Reichsbank* as a direct partner, and was run on less con-

[17] Millioud, *op. cit.*, Eng. trans., 134 *ff.*

[18] *Op. cit.*, 253, 174 *ff.* His opinion is that, under a free trade system, the net gain in industrial efficiency and volume of output would have been appreciably greater, and that the distribution of this gain among the population would have been somewhat more equable.

servative lines than in other European countries. Not only did the banker lend money for commercial ventures. He took an active part in their direction, and in the organization of the Cartels, or trade agreements, which now controlled most lines of industry. The rapid commercial expansion made necessary an enormous increase of capital. Domestic and foreign sources of supply were used to the utmost. Much of the capital for German industry had been drawn from investors in France and England, who were increasingly unwilling to lend it.[19] Credit had been dangerously expanded, and was not elastic. Whether the banks had already begun the practice, so flagrant in Germany during the War, of lending to themselves and substituting paper for accumulated funds, probably will never be known.[20] In any case, their resources were largely tied up in commercial companies, which deliberately practiced overproduction. The investing public was baited by big dividends, and many people in Germany were growing rich in the process. But the gamble depended on the ability of the Cartels to continue indefinitely the marketing of their surplus in foreign countries. As long as there was a chance to secure exclusive trade and large profits in the near future, it might be policy to finance exports for a small return or an actual loss. If the expansion of foreign trade was checked, as we have seen indications that it would be, the securities of the industrial companies were worthless, and business Germany faced a collapse, compared with which the dislocations of a short war might seem a favorable risk.

If this analysis is substantially correct, Germany embarked on war because she had failed in peace. World conquest was attempted, not merely as the policy skilfully

[19] The withdrawal of French capital, in the Moroccan dispute of 1911, threatened a financial crisis, and made it necessary for Germany to modify her demands.

[20] Some evidence for this will be found in Millioud, *op. cit.* A brief account of German war finance is given by Bogart, *Direct and Indirect Costs of the Great World War*, 1919. See also J. L. Laughlin, *Credit of the Nations*, 1918.

propagated by militarists and Pan-Germans, but as the desperate attempt of the commercial group to stave off a crisis. Whether the crisis impending was a collapse of financial inflation, or the slow but sure restriction of export trade, is immaterial to our argument. Germany was approaching the point where further industrial advance was impossible. In the peaceful conquest of world markets, Imperialism was nearing the end of its rope.[21]

The German laid the blame for this situation on his competitors. It would be more true to charge it to the unfavorable reaction of other nations to German policy. The general industrial development which was taking place in the world, proved a handicap to Germany, where it might have been a benefit. She was inclined to look on world trade as if it were a bone, which could be possessed by only one snarling dog. Germany's failure, even before the War, was the failure of a selfish economic nationalism, as contrasted with economic internationalism, which seeks to gain advantage through mutual service in trade, and the dependence of trading countries on each other.[22]

I have not thought it necessary to develop the obvious witness of the War to the moral standards which lie at the basis of present-day national relations, and the disadvantage which Germany suffered through their violation. No nation can break treaties with impunity. Bru-

[21] For several years before the War, the internal situation had been increasingly serious. See Georges Blondel, a recognized authority on Germany, *Les embarras de l'Allemagne*, 2me ed., 1912. The industrial depression in Germany, which followed the Moroccan crisis and the Balkan War, is described from week to week by the Berlin correspondent of the London *Economist*. See also article in *Revue de Paris*, Jan. 15, 1915, by Charles Bonnefon, for 20 years Berlin correspondent of the *Figaro*. Reports of the great trades unions showed 4.7% of unemployment at the end of November, 1913, a larger figure than in the crisis of 1908. Each year showed a large increase in the number of strikes. The Reichstag was getting out of hand, and it was doubtful whether the government could continue either military expansion, or the extreme protectionist policy on which both the Cartels and the great estates depended.

[22] *Cf.* Elisha M. Friedman, *Internat. Commerce and Reconstruction*, 1920. This phase of the subject will be discussed further in chap. 24.

tality and wanton destruction react on the perpetrator. We have reached a point in history where moral laws must be accepted as the normal paths, the social geodesics, of the Universe.

We have still to consider the question of colonies, spheres of influence, and related aspects of the struggle for world trade. To this the next chapter is devoted. Thus far in our argument the competition theory of national relations has not made good. It is based on false biology, outgrown theories of government, and questionable historical induction. In practice it brings heavy burdens and unfavorable reactions, without any compensating advantages, other than those due to natural resources, technical knowledge, hard work, frugality and enterprise.

XXI.

COLONIES AND TRADE.

Toward the close of the 19th century, as the industrial nations began to reach out for new markets, international competition entered a new phase. Certain European countries, attributing England's commercial prosperity to the wide extent of her empire, attempted a similar expansion. The temperate regions of the earth were already preëmpted. But large portions of the tropics remained, rich in food supplies and other raw materials, and offering great possibilities for commercial development. There ensued a scramble, in which England joined, to secure valuable colonies and spheres of influence before it was too late. The atlases of the last 40 years tell the story.

Underlying this movement there were three principal motives. The first was national pride. Back of the diplomatic intrigues of these 40 years, as Lippmann points out, has been the popular feeling that the prestige of their country is the personal concern of its citizens. "There is small doubt that the masses of people in no country would risk war to secure mining concessions in Africa. But the choice is never presented to them in that way. Each contest for economic privileges appears to the public as a kind of sporting event with loaded weapons. The people wish their team, that is, their country, to win. Just as strong men will weep because the second baseman fumbles at the critical moment, so they will go into tantrums of rage because corporations of their own nationality are thwarted in a commercial ambition." [1] Strong as is this psycho-

[1] Walter Lippmann, *The Stakes of Diplomacy*, 2nd ed., 1917, 77.

logical motive for expansion, however much it throws light on human character and history, it really tells us nothing as to man's relation to his Divine Environment. Our problem is to determine whether the Universe is so constituted that competition or common interest brings the greater benefit. The mere acquisition and holding of territory, for the sake of territory, is of no advantage. It may prove a serious disadvantage. Megalomania has proved the undoing of more than one country.

Again, the nation has felt the need of an outlet for its surplus population. Such a need may be genuine, and its satisfaction a real advantage. But the hope to duplicate in the tropics the success of English-speaking colonies in the temperate regions, is essentially unsound. If there has been any surplus population in Europe, it has not emigrated to the tropics. Sir Harry Johnston believes that the control of tropical diseases will make it possible for white settlers to live a normal life in those regions. But no discoveries of Science can neutralize the effects of climate. The Japanese appear to be subject to the same climatic limitations. Not so the Chinese, but China has not yet entered on an era of competitive colonization.

We may confine ourselves to the economic motive. Fundamentally it is for material gain that expansion is practiced and wars are threatened. The chief problem of modern diplomacy is the weak and backward State. Persia or Mexico or Morocco is like the quack-grass farm of a shiftless renter in a rich agricultural country. We see the same potential resources, the same lack of capital and efficient management. The rest of the world needs to have the land developed and the weeds kept down. It is inclined to be impatient with pleas of independence and territorial integrity which hold back economic progress. "The pressure to organize the globe is enormous." [2]

I can think of four possible ways in which the occupation of territory, not properly adapted to white settlement,

[2] Lippmann, *op. cit.*, 87, 98.

might be of advantage to the people of the occupying country: through quick exploitation; franchises and public works; the developing of local resources; and the building up of trade.[3]

The original type of colonial policy is that of quick exploitation. The land and its resources are appropriated by the government, or by individuals or chartered companies, whose objective is a large and immediate return. Natives are compelled to work in the mines, or to gather rubber, ivory, or other ready commodities. The most familiar historic example is the Spanish occupation of Mexico and Peru. In modern times, we have Belgian exploitation of the Congo. Each village was assessed so much rubber per fortnight. If a proper return was not made, any member of the village was likely to be flogged, maimed or shot by a special police force made up of former slave raiders and cannibals. Such a policy must be regarded as a failure from every standpoint. It brutalizes those taking part in it. The wealth gained is of advantage only to a few individuals. The material resources of the colony are exhausted rather than developed. And forced labor, under such conditions, inevitably destroys the native population, whose labor and economic wants might be made the basis for legitimate trade.

The holding of a colony gives an opening for special interests within the colonizing nation. A group of business men who have influence with the colonial office, are likely to reap a rich harvest. Tariffs and taxes give a chance for favoritism. There are railroads and harbors to be built. Mineral and oil lands are subject to lease.[4] Just who is to benefit from the fact that the colonial administration with its rare prizes is in the hands of one's fellow countrymen? Contracts and concessions give an opportunity for profit-

[3] See Paul S. Reinsch, *Colonial Government*, 1902; *Colonial Administration*, 1905; Alleyne Ireland, *The Far Eastern Tropics*, 1905; Benjamin Kidd, *Control of the Tropics*, 1898; Albert G. Keller, *Colonization*, 1908.

[4] Lippmann, *op. cit.*, 96.

able investment. The making of goods called for by such contracts may act as a stimulus to home industry. How far the people as a whole are benefited will depend on what the colony costs the home government. In many cases, as we shall see, colonization has proved an expensive luxury.

We pass to the developing of local resources in the colony or sphere of influence. In the majority of colonizing countries, the prevailing idea of colonial management may be termed permanent exploitation. The acquired territory, or valuable portions of it, is looked on as an estate, to be worked in the interest of its European owners. Plantations are laid out for the growing of tropical products. The marketing of these products proves a source of wealth to the home government, or to groups of citizens in the exploiting nation. With this we may class the modern development of mines and smelters, oil wells and refineries, and other industrial enterprises. Indirectly the entire world may benefit, through the increased production of needed goods. The direct benefit is solely in the form of a return on invested capital. Whether the colony will be an asset or a liability to the nation as a whole, depends largely on the reaction of the native population.

Successful colonial administration is an art, and by no means a simple one. It requires experience, sympathetic understanding, and the highest moral character. As an English writer has said: "The running of a tropical colony is of all tests the most searching as to the development of a nation that attempts it; to see helpless people and not oppress them, to see great wealth and not confiscate it, to have absolute power and not abuse it, to raise the natives and not sink yourself—these are the supreme tests of a nation's spirit." [5]

One of the commonest and most expensive dangers is a radical interference with native traditions and customs. All colonial governments have been guilty of this, though

[5] Quoted by Maurice S. Evans, *Black and White in the Southern States*, 1915, 279.

many of them have gained wisdom through sad experience. Even highly developed civilizations have been scrapped, in the interest of European culture. The attempt is made to introduce the institutions and laws, and sometimes even the language, of the home country. Inherited ideas and ways of thought and action are disregarded. The tribal organization is broken up, communal land ownership abolished, and the native treated as a legal individual, rather than as a member of a family or village group. Assimilation may be undertaken with the best intentions. But the net result is likely to be social chaos. The native prefers the old ways of doing things, and does not understand the new. He loses his traditional loyalties and his morale. The few who acquire a European education, do so with a view to obtaining office under the government, or become plotters against it. Given freedom of contract and individual land tenure, the peasant falls a victim to the money lender, and is ousted from his ancestral holdings. Whatever the material benefits conferred by European civilization, the native population come to look on their conquerors as their arch enemies.

In the exploitation of tropical territory, the chief problem is that of labor. The system was most profitable under Negro slavery. With the general abolition of slavery, many plantations were abandoned, as in the British West Indies. The necessary labor must now be secured by paying wages to freed slaves or to the natives. And that brings us to the psychological attitude of the tropical Negro toward wage labor.

A careful study of this question was made by Sir Sidney Olivier, whose long administrative service in the West Indies gives special weight to his conclusions. The Negro in the tropics, as he says, is not trained or disposed to the production of surplus value. With a generous soil and climate, he does not need to work hard in order to earn what will satisfy his few and simple needs. To double his wages, instead of stimulating him to work twice as many

days, makes it possible for him to work half the number of days. His sense of personal freedom and dignity, by contrast with a former slavery, gives him joy in being his own master and working only when he pleases. In short, he has no mechanical habit of industry, no conception of any essential dignity in labor itself, no delight in gratuitous toil. He lives in a climate where toil is exhausting, and rest both easy and sweet. "These are his deficiencies, judged from the point of view of the European who wants to make use of his labour. From a different point of view, the viciousness of his habits is not so conspicuous. The African is for the most part an unskilled labourer, but he is strong, and when he is pleased to work he is highly efficient within the limits of his skill. He works best in gangs under social impulse, he works with extreme industry on his own small holding, up to the limit of his limited wants. There are no bounds to the trouble he will take in service in which his goodwill or affection is engaged. The capitalist system of industry has not disciplined him into a wage-slave, and I doubt if it ever will." [6]

The needs of white capital have generally been met in one of two ways. The first is that of indentured labor. Laborers are brought in under contract, to work for a fixed term. Unless properly supervised, the system is capable of great abuses. We see it at its worst in the Portuguese island of St. Thomas, where workers were secured from native chiefs in the neighboring colony of Angola, to work the cocoa plantations. The result was a semi-slavery,

[6] *White Capital and Coloured Labour*, 1906, 83. W. P. Livingstone, *Black Jamaica*, 1899, calls attention to the efficiency of Jamaican Negro laborers, when well handled, as in the building of the Panama canal, and in public works on the island. To quote another authority, the South African Native Affairs Commission: "Except in the case of farm labour and the like, which is especially suited to the Native, it must not be forgotten that what is known as paid labour generally, means to the Native, as a rule, absence from home and family, and in some employments irksome and often hard and dangerous work, and the abandonment of the ease, comforts and pleasures of Native village life." *Report*, 1905, 376.

which aroused the indignation of the civilized world and led to a boycott of cocoa grown in St. Thomas. The best results have been secured on sugar plantations in the West Indies. Indentured laborers from overcrowded countries like India or China have made it possible to cultivate sugar, and according to Olivier have actually benefited the Negroes, by providing the casual labor they desire and raising the wage scale. But the introduction of Asiatics tends to crowd out the white artisan, as in the island of Mauritius, and the native worker as in Hawaii. South Africa found it necessary to pass a rigid exclusion law, to prevent its territory from becoming predominantly Asiatic. For the Oriental, as Stoddard says, can not only outwork the Negro, but he can underlive the White.

The second method is to compel the native to work. The attempt is often disguised as a desire to educate and civilize the native by teaching him to want and so to labor, "a theory that coincides most providentially with the purposes for which the white man is there, viz., to get things dug up which the native does not want to dig for." [7] The method may be indirect. Native areas are restricted, with the requirement of individual rather than communal ownership. A heavy head tax or hut tax is imposed. Or the land is monopolized, and the native compelled to pay excessive rent. Not only is a large revenue secured in this way, but the native must submit to a certain amount of wage labor in order to pay his taxes and make a living. Sometimes the method is direct. The refusal to work for wages is made a civil offense, leading to fine and imprisonment.

From an economic standpoint, forced labor is inefficient and expensive. And the effect of all such measures is to generate a thinly disguised feeling of resentment and hostility. An example of this will be given in the next chapter. "If industry," says Olivier, "would be good for the black man and if it is essential that he should learn to be more

[7] Olivier, *op. cit.*, 96.

industrious, the impulse must not come from forcible pressure on the part of the would-be employer, or it will leave no permanent gain, save suspicion and estrangement between the races. It certainly does not leave the habit of industry. That can only be maintained by the stimulus of the worker's own quickened will." [8]

Colonies were in most cases gained by military force. In face of the irritation caused by interference with native customs, and by attempts to exploit native resources and labor, they can be held only by force. The expense of occupation, of keeping order and crushing revolts, is borne primarily, not by the investors in the exploited territory, but by the taxpayers at home. Attempts have been made to shift the burden to the people of the colony, through heavy taxation. But such a course not only hinders economic development, but encourages revolt and further expense.

The Spanish colonies were a constant drain on the national treasury, and their loss came as an economic relief. France, before the War, was spending in her annual budget an average of $20,446,957 on her colonies, outside of the navy and the colonial army. Italy's colonial adventure in Tripoli was undertaken largely in the interest of the Banco di Roma and other financial groups, but the people of Italy paid the bill. In the Herero revolt in Southwest Africa, it cost the German people $160,000,000 to kill off between 20,000 and 30,000 of the natives. The United States spent about that amount for a very much larger job of the same sort in the Philippines, and Edward Atkinson estimated the resulting increase in army and navy expenditure at $2.00 per year for each person. Unless substantial and general trade advantages can be secured through colonies, permanent exploitation does not compensate the people of the home country for the added burden of taxation, however great the returns to individual investors.

Toward the middle of the 19th century, through the in-

[8] *Op. cit.*, 159.

fluence of humanitarian sentiment and the teaching of the Free Trade school, British colonial policy underwent a radical change. The practical independence of the English-speaking colonies was recognized. And other parts of the Empire were considered as in training for self-government. What especially interests us is the fact that the tropical colony came to be regarded, not as a possession, but as a trust, to be administered for the benefit of the native population. With many exceptions in theory and practice, this policy has been followed in recent years by the British and the Dutch. And the relative success of their colonies, from the standpoint of the taxpayer at home, is seen in the low cost of administration, as well as in the development of trade, of which I shall speak in a moment.

This essentially Christian principle has been recognized in the section on Mandatories of the League of Nations Covenant. "To those colonies and territories which as a consequence of the late war have ceased to be under the sovereignty of the States which formerly governed them, and which are inhabited by peoples not yet able to stand by themselves under the strenuous conditions of the modern world, there should be applied the principle that the well-being and development of such peoples form a sacred trust of civilization, and that securities for the performance of this trust should be embodied in this covenant. The best method of giving practicable effect to this principle is that the tutelage of such peoples be entrusted to advanced nations who, by reason of their resources, their experience, or their geographical position, can best undertake this responsibility, and who are willing to accept it, and that this tutelage should be exercised by them as mandatories on behalf of the League."

Turning to the question of trade, it is obvious that the opportunity to market tropical products and sell goods to the native people, is likely to be of general advantage to any industrial nation. The largest opportunities for commercial expansion are in this field. Whether the pos-

session of colonies will be beneficial, from this standpoint, appears to depend on the way they are handled. We are again confronted with two opposite lines of policy.

Trade may be secured by a nation through monopoly. Preferential tariffs are used to divert the commerce of the colony to the home country. The results of this policy are a good illustration of the working of Jesus' law of action and reaction. Commercial selfishness tends to defeat itself, in three principal ways. In the first place, experience shows that, under such a system, the normal development of native wants and local industries is slower than where trade can follow regular lines of supply and demand. If world markets are not open, the colony sells less, and therefore buys less. Secondly, as goods from the home country pay no duty, and as the neutral merchant tends to be driven away by high duties and vexatious restrictions, little revenue is derived from customs, and the colony becomes expensive from the standpoint of administration. In the third place, the preferential tariff barrier, by keeping out goods which could be bought to better advantage elsewhere, means a higher price charged by the producer and paid by the consumer. In the matter of exports, the merchants are able to charge the colonists more for their manufactured goods. Home industries are stimulated by the fact that they have a practical monopoly of the colonial market. But in imports from the colony, the persons benefited are not the ultimate producers. The merchants pay the colonists no more for their produce. And when they sell it to the people of the home country, they raise the price to the level of similar produce from other countries, after the high duty has been paid. A few favored individuals are financially benefited. But the cost of living is raised and purchasing power lowered for both the people of the home country and the people of the colony. The net result is a serious constriction of trade, for both home country and colony.

Of the many examples which might be given from mod-

ern colonial history, the most outstanding is that of France. In 1892 the protectionist reaction led to the assimilation of the principal French colonies to the high customs duties of the mother country. That is, a tariff wall, amounting to a preference of from 50 to 100 per cent, was erected to keep colonial trade in the hands of French merchants. The system has worked so badly that it has aroused a growing protest, not only from the colonies themselves, but from the Chambers of Commerce of Havre, Lyons, Marseilles and Paris. In the words of the latter: "Tariff assimilation has been as dangerous as political assimilation. . . . The régime of 1892 has checked the development of the colonies and has impoverished them."

To be specific, let us take the case of Madagascar. In 1897, when the preferential tariff policy was applied by placing the island among the assimilated colonies, the external commerce, chiefly imports, amounted to 20 million francs, about equally divided between France and her colonies and England and her colonies. By 1912, with the building of a railroad and the development of agriculture, exports had risen to nearly 60 million. Of this France absorbed 41 million. Imports totalled 50 million francs, of which France supplied 44 million. If the item of fabrics is subtracted, however, the import trade had diminished rather than increased. "Madagascar," says Professor Girault, "gives on the whole the impression of a new colony whose growth has been abruptly checked by the application of an ultra-protectionist régime. The commerce of a colony to which so many Frenchmen have brought their capital, should not have been limited to 100,000,000 francs, nor indeed to 150,000,000 or 200,000,000. The results obtained are far from being commensurate with the efforts made. The high cost of living from which the European in Madagascar suffers, as much as the native, has thwarted the good intentions of the colonists. It has prevented the native from satisfying the new wants which the Europeans were endeavoring to create in him. Cus-

toms duties have raised by forty-five per cent the price of cotton goods in Madagascar. Was not this to render the merchandise unattainable for a set of poor customers? Thanks to the régime of assimilation, the external commerce of Madagascar is, to be sure, wholly in the hands of the French. But the colony has paid dearly for this gain in French trade. Foreign commerce disappeared, and with it the revenue from the customs duties. Import duties in 1912 brought in only 930,000 francs to the colony. This does not represent a thirtieth of the receipts requisite to budgetary equilibrium. . . . The colony, in order to cover its budgetary requirements, has been obliged to have recourse to other imposts, heavy and ill-suited to its condition. To supplement the customs duties, it has been necessary to create consumption taxes, falling upon French products as well as upon foreign products, which increase still more the cost of European merchandise imported into Madagascar. The natives, the colonists, and the government of the colony have all been sacrificed. A single French industry, cotton manufacture, has drawn an appreciable profit from the application of the system. This profit may be calculated at approximately ten millions in fifteen years. It was to permit this class of manufacturers, important, no doubt, but narrowly limited, to gain these ten millions, that the fortunes of a country larger than France have been compromised. The discrepancy between the advantages gained by the manufacturers and the sacrifices imposed upon the colonials is truly shocking. 'It would have been an advantage to the colony,' some one has written, 'to have paid an indemnity of ten millions to the French textile manufacturers and thus to have recovered liberty of action in the matter of its customs duties.' " [9]

The second policy is that of the open door, where the

[9] Arthur Girault, *The Colonial Tariff Policy of France*, 1916, 222. *Cf.* Reinsch, *Colonial Administration*, 238; Wm. S. Culbertson, *Commercial Policy in War Time and After*, 1919, chap's 15-16.

people of the colony are left free to trade with whom they will. Import and export duties may be levied for the sake of revenue, or to protect colonial industries. They are not used to give a preference to merchants in the home country. In this policy the British were the pioneers. The handling of the colony as a trust, for the benefit of the native population, brought opportunities for trade from which the British people benefited, along with the rest of the world. In this case, the advantage to be gained depended not on special privilege but on goodwill and superior service, that is on the common interest of home country and colony. Competition of markets kept down costs to the consumer, both in the home country and in the colony, increased purchasing power, and stimulated trade. Fortunate in the location of her tropical colonies, and wise in their handling, the open door policy helped in the later development of Britain as a great trading nation. A similar story, from the colonies of the Netherlands, will be told in the next chapter. In French West Africa, which is on a free trade basis, the commerce of the home country has shown rapid development, in the face of severe competition.[10]

Where the open door door policy prevails, trade follows supply and demand, rather than the flag. It is not necessary to own colonies in order to secure tropical markets, as we see from the success of Danish and Belgian firms. In fact ownership may bring the curse of bureaucracy and prove a serious handicap. German trade with her own colonies was a minor item, paying very low interest on the national investment. As Reinsch said: "German commerce is most prosperous where there are no German officials." With British possessions, however, for whose

[10] Britain has been, in some cases, as guilty as the closed door countries in discouraging local industrial development in her colonies. Part of the poverty of India must be attributed to a tariff policy dictated by cotton manufacturers in England. The sugar industry has also been hindered, in the interest of the sugar plantations of Mauritius, managed by British capitalists.

conquest and administration she was at no expense, she did a large and growing business. In 1913, Germany sold India $35,876,000 worth of goods, an increase of 91% in five years, and bought $128,936,000, an increase of 73%. In fact about half of her imports came directly or indirectly from the British colonies.

The chief advantage in having colonies of your own, is to prevent such regions from being closed to your commerce by trade monopoly. Germany had long been haunted by the fear of a British *Zollverein,* an exclusive trade area, which would shut out the merchants of other nations, as British merchants had been driven from Madagascar. For this feeling there was some justification in the tentative steps taken for preferential tariffs within the British Empire. Fear of tariff reprisals kept German colonies nominally open to world trade.

Colonies are increasingly difficult to hold, in the face of nationalist movements.[11] In their treatment of other peoples, the industrial countries have brought out a dangerous reaction among the native populations of Asia and Africa. Some examples of this will be given in the next chapter.

It is unfortunate for the peace of the world that nations are inclined to take the short view of selfish exploitation, rather than the long view of mutual advantage, as advocated by the political economist. To this subject we shall return, in our chapter on Internationalism. Colonial practice is apt to go contrary to the most approved colonial experience. But it is this experience, with its witness at various points to the law of common interest, which confirms our picture of a Christian Universe. We are concerned not so much with human nature, as with the world to which human nature must in the long run adjust itself.

[11] See Lothrop Stoddard, *The Rising Tide of Color,* 1920, whose value as a historical summary is independent of the author's vagaries about the Nordic race; Herbert A. Gibbons, *New Map of Asia,* 1919; H. M. Hyndman, *The Awakening of Asia,* 1919.

XXII.

THE TREATMENT OF OTHER PEOPLES.

We have been considering, on somewhat broad lines, the competitive theory of national relations, in both its military and its commercial aspects. In this chapter I propose to examine certain specific cases of action and reaction. My object is to show how the law of common interest operates. Cases are chosen to illustrate a variety of objects, from independent nations to conquered regions, and from civilization to backwardness and savagery. Unfortunately most of them show the lack rather than the presence of goodwill. If the method of Behavior Psychology makes good in this field, future statesmen will ask, in regard to any course of action affecting other peoples: What reaction will it bring out in the people concerned? Will this be favorable, or unfavorable? According to the principles of Jesus that is practically the same as asking: What course of action is right?

The leading nations of Europe have followed a very different principle. To round out the story of the World War, we may take the diplomatic history which gave Germany the feeling of being thwarted in her policy of expansion. The Turkish Empire, potentially rich but undeveloped, offered a far more promising field for *Weltpolitik* than African jungles or Pacific islands. Railway concessions granted to German financiers in 1888, developed into the plan for a line through Bagdad to the Persian Gulf. The visits of Emperor William to Turkey in 1889 and 1898, led among other things to a concession for the construction of this railway. The only feasible terminus was

the port of Koweit, ruled by a sheik who was practically independent of Turkey. When the German mission arrived at Koweit to make the necessary arrangements, they found that the British had been ahead of them. A secret convention had already been arranged by Col. Meade, the British resident of the Persian Gulf. In return for special protection, the sheik bound himself to make no cession of territory without the consent of the British government. The Sublime Porte, under German prodding, sent a vessel to Koweit in 1901. But British warships were on hand to uphold the independence of the sheik.

The scene shifts to North Africa. In 1904, a secret agreement was drawn up between Britain and France, by which Britain was given a free hand in Egypt, in return for recognition of the special interests of France in Morocco. Alarmed over this extension of rival influence in another potentially rich territory, Germany seized a favorable opportunity to force the international Convention of Algeciras, in 1906, which guaranteed the complete independence of Morocco. No one lived up to it. While German colonists were doing their best to make German intervention necessary, France was taking advantage of tribal wars to undermine the Sultan's authority. On May 21, 1911, French forces occupied the capital. The Sultan was soon obliged to put himself under the protection of the French army. Germany sent a warship to the port of Agadir. But in the end she was forced to recognize a French protectorate in Morocco, in return for minor cessions of territory in equatorial Africa.

The scene shifts back to the East. Persia's revolution, on New Year's Day, 1907, which secured the granting of a constitution, was followed by the Anglo-Russian Convention of August 31. Burying their past differences, these two nations divided Persia into spheres of influence, Russia taking the North and Britain the South. Germany tried Turkish intervention in northern Persia. She sent her agents to stir opposition to the Convention among the Per-

sian constitutionalists. Russia countered by backing the reactionary Shah, and in 1909 occupied parts of the territory to suppress civil strife. Germany then tried to make terms with Russia, and concluded the Accord of Potsdam, which guaranteed the open door in North Persia. But the Russian troops were not withdrawn. Persia had lost her constitution and her independence, and Germany another chance for expansion. Her political control of Turkey, Morocco and Persia might have proved of doubtful commercial value. But all parties concerned thought such "possessions" an advantage, and their lack a serious disadvantage. Under the circumstances, a European war had become inevitable. The leading men of Germany felt that she was being crowded to the wall, that her future demanded the crushing of France and Russia, and a possible contest with Great Britain.[1]

The treatment of China by stronger nations is of special interest, as it furnishes examples of both favorable and unfavorable reaction. In 1900, European exploitation brought the Boxer outbreak. This was suppressed by an allied expeditionary force, which captured Pekin. John Hay, who was serving as Secretary of State for the United States, insisted that the Chinese government was still in existence, and that its territory must not be partitioned. He was able to obtain from the Powers a declaration for the open door in China. An indemnity of over $687,000,000 had been imposed for the outbreak. Of this, America's share was $24,000,000, payable in 40 annual installments, with interest at 4%. Finding that this sum was far in excess of the cost of the Pekin expedition and the losses of American citizens, the United States arranged that the annual installments should be diminished. The amount thus remitted will amount by 1940 to over $39,000,000. The effect on China of this treatment was immediate and

[1] The story has been written many times. I have followed the account of Herbert A. Gibbons, *The New Map of Europe*, 3rd ed., 1915.

strong. It brought a general feeling of confidence and friendship toward the United States, for which a basis had already been laid in the philanthropic work of American missionaries. The Chinese government decided to use the amounts remitted as a fund for educating Chinese students in America, a policy still carried out. The goodwill engendered carried with it a strong preference for American trade. The force of this example is not weakened by the fact that we were not quick to take advantage of the commercial opening, and that our treatment of Chinese in this country and the conduct of some of our financiers in regard to railway concessions did much to neutralize the former goodwill. America has still to learn that, in dealing with Orientals, she is dealing with her best prospective customers.[2]

In 1897, the murder of two missionaries had given Germany the necessary excuse for extorting a lease of the port of Kiao Chau for 99 years, with preferential rights in the development of the rich Shantung peninsula, the holy land of China. According to Gibbons, traders in the home country "have claimed that the *political* presence of Germany on the Shantung peninsula and the dealings of the German diplomats with the Pekin court had so prejudiced the Chinese against everything German that it was harder to do business with them than before the leasehold was granted. They actually advocated the withdrawal of the protectorate for the good of German commerce!" [3]

In 1914, Japan, under the dominance of the military party,[4] entered the War, and took over the German hold-

[2] See Sidney L. Gulick, *The Fight for Peace*, 1915, chap's 9 and 10; John W. Foster, *Am. Diplomacy in the Orient*, 1903, 423 *ff.*

[3] *New Map of Europe*, 45.

[4] Imperialism of this Prussian brand has been consistently opposed by the Liberal party in Japan. It is unfortunate that the "behavior" of a nation should be so largely determined by the policy of the group which controls the government. We have the same thing in Industry. Many of the stockholders and directors of a corporation may be liberal minded. Yet if a majority of the directors, or even a dominating executive, is reactionary, the policy of the company will be reactionary; the response of employees or

ings, which had thwarted her own plans for the development of Shantung. The capture of Kiao Chau was preceded by the military occupation of the entire province. On May 8, 1915, China was compelled to accede to the majority of the Twenty-one Demands. These confirmed Japan's claims in Shantung, Manchuria and Mongolia, gave her practical control of the Chinese iron industry, and a basis for the future exploitation of Fukien province, opposite Formosa. This was followed by large loans to the corrupt and subservient officials who had come to be in charge of the government. Part of the money was used to build up a military force that would maintain this pro-Japanese party in power in North China. Meanwhile, the country was flooded with cheap Japanese goods. Secret agreements secured during the War from England, France, Russia and Italy, made it necessary for the Peace Conference to grant Japan's claim to Shantung.

This decision was announced at Paris on April 30, 1919. The reaction in China began among the students. In Pekin, on May 4, a body of 3000 tried to appeal to the ambassadors of the Allies. Prevented by soldiers from entering the Legation Quarter, they marched to the home of the former Minister of Finance, where they found also the former ambassador to Japan. Both men were attacked, and the latter badly beaten. Plans were matured during the Week of National Humiliation, which had been observed each year in memory of the Twenty-one Demands. The organizing of students proceeded throughout the country. Their platform contained four planks: dismissal of corrupt and treasonable officials; a guarantee from the Allied governments of the immediate return of Shantung; a cancellation of the 21 demands, agreed to under duress;

public may be predicted on that basis. I do not mean in this book to cast national balances. But in fairness to Japan two other things should be noted. In her treatment of China she was following the example of other nations. And the history of Japan since 1895 is largely her reaction to foreign interference at the close of the war with China.

freedom of speech and press. To enforce this program the measures decided on were a boycott against Japanese goods and a student campaign to arouse patriotism. On May 26, pupils in the various cities struck and gave themselves to the work of propaganda. In Shanghai alone 20,000 met and paraded. The boycott was taken up by the merchants and rigidly enforced. Japanese goods were taken out and burned, Japanese banknotes were refused, the pledge was made not to buy any more goods from Japan. On June 3, a thousand students were arrested for patriotic demonstrations. In protest, stores in Shanghai and other cities closed their doors, with the statement that they would not do business while traitors remained in office. Train men joined the national strike, and other classes of workers followed. On June 8 the student prisoners were released with apologies, and on June 12 the three most obnoxious pro-Japanese officials were dismissed. The stores reopened with a flourish. Weak as it was, the Chinese government refused to sign the Peace Treaty.

The anti-Japanese boycott, which still continues, was extremely serious, and contributed largely to the financial crisis in Japan in the Spring of 1920. The trade of Japanese steamship lines fell from 154 tons per trip in 1918 to barely 71 tons during the first ten months of 1919. The company which was operating a system of palatial steamers on Chinese rivers, found its vessels practically deserted for the old and undesirable ships of its British competitors, and was losing money at the rate of a million yen a month. Japanese toys practically disappeared from China. From May to September, 1919, cotton cloth imported from Japan fell from 867,000 to 167,000 yards; umbrellas from 343,000 to 6,000; canvas bags dropped off 66.9 per cent; matches 46.1 per cent; paper 64.6 per cent.[5]

[5] W. Reginald Wheeler, *Current History*, 10, pt. 2, 534, Sept., 1919; *Millard's Review*, Jan. 3, 1920; John and Alice C. Dewey, *Letters from China and Japan*, 1920; B. L. Putnam-Weale, *The Fight for the Republic of China*, 1917.

The reversal of British colonial policy during the 19th century has already been noted. As regards the reaction of English-speaking settlers in the temperate regions, the difference is highly instructive. The attempt at the close of the previous century to treat the American colonies as a possession, to be exploited through taxation and exclusive trade, led to the Revolutionary War and the loss of what would have become the richest portion of the British Empire. Taking a leaf out of experience, the later colonies of the same type were allowed to become practically self-governing, with little more than a sentimental connection with England. They have since given two most substantial expressions of goodwill. Preferential tariffs in favor of British trade were adopted, as a purely voluntary act, by Canada, South Africa, Australia and New Zealand. In the World War, these countries came to England's aid with a remarkable outpouring of men and money. Canada alone, out of a population of approximately 8,000,000, contributed 610,031 men, of whom a tenth never returned, and over a billion and a half dollars. Having lived on the border during the War period, in sound of Canadian bugles, within reach of Canadian scorn, and with many close friends in the overseas service, I gained a very deep impression of the loyalty of the Dominion.

In the cases now to be considered, we shall find a phenomenon similar to that already met with in the Industrial field. The primary reaction of human groups is not physical or economic, but psychological. The group, like the individual, desires something more than fair treatment and material prosperity. It craves self-expression, the right to live its group life with independence and dignity. The rise of this spirit of racial nationalism has greatly complicated European politics, and made its proper handling much more delicate. Until the close of the 18th century, racial antagonisms counted for little. Russian and Finn, Magyar and Rouman, lived side by side, with prac-

tically no irritation due to racial differences. With the French Revolution, rivalries and wars, hitherto merely dynastic, began to take on a popular character. National unity came to be found in common blood. New value was attached to racial language and traditions. The explorations of scholars in the field of history and philology, with the consequent revival of ancient speech and literature, came at a time of keen rivalry, "when everything that tended to stimulate racial vanity was caught up and used by those statesmen and other leaders who sought to embark on policies of expansion and aggression even at the cost of arousing national jealousies or embittering national animosities." [6]

Whatever we may think of this movement in the abstract, it is here in very concrete fashion, to be reckoned with in national action and reaction. Take for example the case of Slesvig, which could be duplicated a score of times in modern Europe. In 1864, the duchies of Slesvig-Holstein were taken from Denmark by the Austrian and Prussian armies, and later united to Prussia. The population of North Slesvig was predominantly Danish. Systematic attempts were made by Prussia to Germanize the district. The name of the province was written Schleswig. German was made the official language, and was gradually substituted for Danish, not only in the courts and the army, but in the churches, the schools, and even on the playground. The mere singing of Danish national songs in the home was a cause for arrest. The result of such measures was the exact opposite of that intended. They merely stimulated the racial feeling which Prussian officials were attempting to suppress. In 1905, of the 148,000 inhabitants of North Schleswig, 139,000 spoke Danish, including more than a third of the children of German-speaking immigrants. The Peace Treaty, at the close of the World War, made provision for the plebiscite promised in 1866 but never held. The vote on reunion

[6] James Bryce, *Race Sentiment as a Factor in History*, 1915.

with Denmark stood 75,023 for, and 25,087 against. The latter vote came almost exclusively from the descendants of German settlers, and from German officials and soldiers born within the voting zone.

For more complex reactions, under the form of nationalism, I select the case of Egypt. It illustrates, at the same time, the effect on the Oriental mind of the impact of Western civilization. In 1882, the anarchy in connection with Arabi's revolt led to a reluctant intervention by the British government. It was believed at the time that the occupation of Egypt would be merely temporary. An actual protectorate was veiled under the fictions of Turkish suzerainty and the local authority of the Khedive. The object of the British was to restore order and put Egypt on its feet financially. The enormous foreign debts contracted by the Khedive Ismail made this no easy task. Its successful accomplishment was due to the administrative genius of Sir Evelyn Baring, afterward Lord Cromer, who was sent out as agent and consul general in 1884, after previous service in connection with the Franco-British commission controlling the Egyptian debt. For 23 years he gave himself to the slow and laborious work of reconstruction. The record of those years is one of the marvels of modern history. Egypt was given an efficient and honest administration. Taxes were lightened, and forced labor of the peasants abolished. The native army, trained by Kitchener, reconquered the Soudan. The great Assuan dam and other irrigation works assured a regular supply of water and an increased area under cultivation. Abject poverty gave place to prosperity. England had proved the title to her guardianship. If she gained from the revival of Egyptian trade, it was "not at the expense of others, but along with others." As Milner said proudly, "neither directly nor indirectly has Great Britain drawn from her predominant position any profit at the expense of other nations."

The earlier reactions of the Egyptian people were favor-

able. They were grateful for the benefits which British rule conferred. As the memory of the former oppression faded, however, occupation was accepted, as Chirol says, with "growing impatience of the tutelage they believed themselves to have outgrown." [7] Lord Cromer was conscious, on his retirement in 1907, that the days of paternal autocracy were about over. The growing spirit of nationalism was a power to be reckoned with. British influences and Western ideas "had helped to liberate new and conflicting forces that made new demands on British statesmanship." It was not easy to appraise this movement. Thus far it was a class movement, confined to the aristocratic group. One has the feeling that contact with Europe had brought a demand for personal rights, without any conception of corresponding duties. The educated Egyptian was jealous for office, and sensitive regarding social slights. The reforms instituted had touched many vested interests of oppression in the former ruling classes. Political propaganda was voiced by a scurrilous press. And in the background there was ever the suspicion of an ignorant and excitable people toward those of alien race and religion.

Neither of Cromer's successors, Gorst or Kitchener, appears to have had the capacity to meet and guide the situation that was arising. The staff of British officials were no longer in close and sympathetic touch with the people. But no serious blunders were made until 1914. When Turkey entered the War, a British protectorate was at once proclaimed. This meant to a fanatic population the transfer of official rule from a Mohammedan to a Christian power. Nothing was done to reconcile them to the new relationship, or to secure, as in India, their free co-

[7] Sir Valentine Chirol, *The Egyptian Problem*, 1920, which I have substantially followed. See also Earl of Cromer, *Modern Egypt*, 1908; Alfred Milner, *England in Egypt*, 1892. A less favorable view of the British occupation, as in Elbert E. Farman, *Egypt and her Betrayal*, 1908, would not affect my use of Egypt as an illustrative case of reaction.

operation in the War. Egypt became a British army camp. The military operations brought heavy financial burdens, which fell chiefly on the peasants, who had not hitherto been affected by the political agitation. Food was procured through forced sales. The conscription of workers for the labor corps in the Sinai peninsula was badly managed and bitterly resented. Wages and agricultural prices had risen during the War, but in many cases costs and rents had risen still higher. The average Egyptian, whether aristocrat, fellaheen or proletarian, had come to regard the Protectorate as equivalent to national slavery. Some at least of the leaders had faith in the high ideals which Allied statesmen had been holding before the world. Egypt was caught by "the magic of a phrase": the right of a people to self-determination.

Two days after the Armistice, a group of prominent Egyptians met to demand complete independence. They were denied the right to be represented at the Paris Conference, in spite of direct appeals to Lloyd George, Clemenceau, Orlando and Wilson. Members of the Egyptian ministry asked permission to proceed to England, to state their case. Their request was refused. The government warned the leaders, and later arrested four of the most prominent. Within a few days the whole Nile valley was in revolt.

With the details of this insurrection movement, and its suppression, we are not concerned, merely noting that it involved all classes of the population, even, for the first time in history, Mohammedan women. Nor is it necessary to discuss the fitness of Egypt for self-government. Only the future can test the wisdom of the guarded independence recommended by Lord Milner's mission. When one has stirred up a hornet's nest, it is sometimes the part of wisdom to withdraw from the hornets.

For the case of a tropical dependency, the various stages of Dutch policy in Java furnish an instructive series of action and reaction. When the Dutch East India Com-

pany began operations, in 1602, the island had been ruled for centuries by Hindu and native conquerors. The old tribal organization and the spirit of personal independence has been almost completely lost. Native monarchs regarded themselves as owners of the land, from which they extorted labor and produce, through a highly centralized system. The population was kept down by frequent wars. Only a small proportion of the unusually fertile soil was under cultivation. Standards of living were low, and native needs easily satisfied, outside of the exactions of their rulers. The Company attached itself to the existing political organization, as a sort of economic parasite. Its one aim was revenue. This was secured partly by tribute. Through the native rulers, the people were also forced to produce, for a small return or none at all, articles which could be sold with profit in the Netherlands. The system proved a failure, from every standpoint. The Company itself was an irresponsible monopoly, badly administered and honeycombed with corruption. It tried to combine the functions of trader and ruler. In the earlier period, by procuring tropical products at low cost and selling them for high prices, large returns were made to the stockholders. With the fall of prices in Europe, and the growth of competition from foreign smugglers, profits turned to losses. Dutch rule was constantly extended, in order to develop further the forced assessments of produce. But by 1798 the Company was bankrupt, and its powers and debts were assumed by the State. Commercially, the island remained undeveloped. Nothing had been done for the native population, except to add to their previous burdens. The one positive contribution of the Company was the suppression of native wars.

The next stage in Dutch policy was that of the Culture System. The Netherlands government had taken the place of the former native rulers, as owner of the land on the

island. Confronted with a large colonial debt, and in need of funds at home, it looked on its East Indian estate as a valuable source of income. To secure immediate returns, and solve the vexing labor problem on tropical plantations, the plan of enforced cultures was adopted. Instead of paying to the government a certain proportion of their ordinary crop, which was rice, the natives were to put at its disposal a part of their land and labor-time. On this land and with this labor, for which a small return was to be made, they were to grow coffee, sugar or other products which the government could export. The system broke down, like its predecessor. Forced labor, however cheaply secured, is always expensive. A government, even if well administered, is not competent to manage the exacting operations of a vast tropical farm. The whole scheme was inspired by a spirit of selfish exploitation. And the same spirit showed itself in the administration of the island. The Dutch officials, pressed by the home government for immediate revenue, passed on the pressure to the native contractors, and these to the village headmen. Each lined his own pockets on the way. The earlier regulations for the protection of the natives were disregarded. The system became so oppressive that a movement of population began from the culture districts. Some sections lost a half to two thirds of their people through emigration to other parts of the island. Those who remained suffered from famine and pestilence, due to the diminished food supply. They were not left enough land and time to raise food, or paid enough wages to buy it. The famine of 1849-50 carried off a third of a million people in central Java, one of the richest regions on earth. That any financial benefits were received, in return for the ruin of a valuable empire, was due solely to the high price of coffee in Europe during the period. On most of the other crops the government lost money. The soil was impoverished, and the culture products constantly deteriorated in quality. By 1870, when light was turned on the system,

proper book-keeping showed that the net gain had entirely vanished.

The Dutch people had been kept in ignorance of the true conditions in the Indies. When the facts became known, about 1860, an agitation for reform began which, after ten years, put the Liberal party in power and brought a reversal of Dutch colonial policy. The welfare of the natives was made the prime consideration, rather than income for taxpayers in the Netherlands. The government renounced its right to enforced labor, and the culture system, even on a wage basis, was gradually abolished. In earlier periods, considerable tracts had been sold to foreigners, but the further alienation of agricultural land was now forbidden. At the same time, the development of large plantations was encouraged by a system of leases, under strict regulation. The Dutch officials studied the native political organization, and attempted to make the land tax and the local administration more equitable. Hopeful beginnings were made in primary and secondary education, and public works undertaken on a business-like basis.

Many problems remain to be solved. But the general success of the new policy has been suggested by Professor Day: "Government officials hold planters in a position of extreme dependence, and may sometimes abuse their authority. Yet this course seems justified by the fact that on one side the native has been well protected, and on the other production has steadily and rapidly increased. . . . Welfare in the European sense hardly exists in Java now. The people prefer to increase in number rather than to raise their standard of life as individuals. They seem, however, in spite of a great growth in population, to have at least maintained the customary standard. Articles describing the private economy of the Javanese show that they have a pitifully small margin above the mere necessaries of life. Oriental and European standards are vastly different, however; measured by the Oriental standard, or

measured by their own past history, the Javanese are now comparatively well-to-do." [8]

Little or no return was made to the home treasury. But the colony has been self-supporting, besides carrying the cost of the long war in Sumatra. Differential duties in favor of Dutch industry and shipping were abolished in 1872. According to our Minister from the Netherlands: "The results of the open-door policy are very satisfactory. Far from having stunted home enterprise, the foreign competition has stimulated and strengthened it." [9] The trade of the Dutch East Indian colonies trebled in 23 years, reaching $400,000,000 in 1913. Nearly a third of this was with the mother country.

In the last case which will be cited, the treatment of the natives in Natal, we are dealing with a virile and high-spirited race, which had preserved its tribal organization. Widespread unrest, culminating in the revolt of 1906-7, led to a series of important investigations. The general situation disclosed was something like this. According to the census of 1904, the Bantu-speaking Zulus or Kaffirs numbered 904,041, or more than nine blacks to every European. The majority were still settled on native reserves, under their tribal chiefs. Each kraal or village, located on land assigned by the chief, was surrounded by garden plots cultivated by the women, and by communal pasture for the cattle tended by the men. The first effect of British rule was the elimination of tribal wars. This led to a rapid increase in population, amounting to over 20 per cent in the 13 years from 1888 to 1904. As agricultural methods were extremely primitive, the exhaustion of the soil made it necessary to move the kraal every few years. It was increasingly difficult for the reserves to support the growing native population. Many had settled on Crown lands and European farms, either as tenants or

[8] Clive Day, *The Dutch in Java*, 1904, 379. See also *Java*, British Foreign Office Handbooks 82, 1920.

[9] J. T. Cremer, *Proc's of Am. Econ. Assoc.*, Dec., 1918, 341.

as squatters. The former were subject to high rents, and the latter to eviction at any time. In some cases such lands had been purchased by individuals or groups of natives. But on the reserves, no steps had been taken, as in Cape Colony, to encourage the change from communal to individual ownership.

The second great impact of European civilization was the demand for labor, which followed the opening of the Transvaal mines. Natives were recruited, for a few months at a time, from all parts of South Africa, returning to their kraals at the end of their contract. This employment had come to be carefully supervised by the government, in coöperation with the mining companies. Its effect was two-fold. In the first place, it was a real step in the economic development of the native population, opening up new wants and the means of supplying them. In many cases returning laborers used their earnings to purchase cattle, and even ploughs. Young men would submit to temporary exile and distasteful labor, in order to accumulate enough to marry. The second effect of the labor camps was to break up the old community life, and the moral obligations which it enforced. The young men who had spent six months at Johannesburg or Durban, were sophisticated and independent of authority. Many of them had acquired European vices. The same loosening of authority tended to make the Kaffir women and girls idle and immoral. The white man was undermining the tribal and family organization, with its code of ethics, without putting anything in its place.

Christian missionaries had done most efficient service. But the native Christian found the door closed to the economic advance for which he was fitted. Through fear of political movements, the Natal government would not allow native churches, unless these were officially registered and supervised by a white pastor. Outside of the mission stations nothing had been done in the way of education or industrial training, for both of which the natives

showed a growing demand. Only about 11,000 children were enrolled. In aid of these schools, the government spent a paltry $37,865 in 1905-6, out of a direct contribution to the treasury by the natives of $1,532,420. No representation accompanied this taxation. There was practically no opportunity for a Kaffir to obtain the franchise, even if well educated and a large property holder. In the entire colony, only two blacks were entitled to vote. In the scathing words of the Native Affairs Commission: "No marked degree of individual progress in agriculture, architecture, or handicrafts, manners, or morals, can be discovered as due to direct Government action."

The Natal government merely reflected the sentiments and prejudices of the ruling race. It attempted, in a rather blind and mechanical way, to protect the Kaffir as a minor ward. At the same time its policy, if it can be said to have had a policy, was to keep him in a position of permanent inferiority. The average white settler looked on the native, not as an agriculturist, whose economic advance would add to the wealth of the country, but as a common laborer for farm, kitchen or warehouse. To secure the black's uncertain and inefficient service, he was forced to compete with the mines and other industries. To educate the Kaffir would be, from this point of view, to spoil him as a workman, and make him dangerously independent. Compulsory manual labor was confined to the draft of natives furnished by the chiefs for roads and other public works. But taxation was apparently intended as an indirect incentive to industry. The natives were compelled to pay $3.50 annually for every hut. In 1905, in order to reach the floating class of young men, a head tax of $5 was imposed, for all adult males who did not pay the hut tax. This heavy burden of taxation, for which they received little return, fell on a people impoverished by rinder-pest, locusts, and the neglect of cultivation.

The year 1906 saw a series of murders of white men,

growing out of attempts to collect the poll tax. A revolt, headed by a deposed chief, was suppressed only by energetic measures, 3500 natives being killed and 2000 more imprisoned. The Native Affairs Commission found that "the chasm between the races has been broadening for years, and that the attitude of the Natives is now one of distance and distrust." By contrast with the kraal-man, who simply desired to be left alone, "to live his own life of sensual stagnation," the more ambitious Zulus had become aggressively conscious of their individual and racial rights. There was a growing sense of power and solidarity among the Kaffir tribes of South Africa. The cry of Africa for the Africans had begun to be sounded. An Ethiopian church movement, revolting from white tutelage, drew in a considerable proportion of the native Christians. I close with another quotation from the Commission's report:[10] "Weighed and wanting must be the reluctant verdict upon past efforts to reconcile [the Natives] to changed conditions of rule and policy, and to convert them into an element of stability and strength. Let the question be fairly put and plainly answered. What is to be the destiny of this Colony, with its overwhelming Native population? Noted for their fecundity and virility, they will not die out or succumb to ordinary adversity, and, as we can neither assimilate nor destroy them, political forethought and common sense alike call for a settlement of the question on a broad, enlightened, and permanent basis."

[10] Report of *Native Affairs Commiss.*, Natal, 1906-7, 19 (*Cd. 3889*, 1908). See also Report of *S. African Native Affairs Commiss.*, 1903-5 (*Cd. 2339*, 1905); S. African Native Races Committee: *The Natives of S. Africa*, 1901; *The South African Natives*, 1908.

XXIII.

THE COLOR LINE.

Already we have passed more than once within the color line. The treatment of other peoples enters a peculiarly delicate phase, where white and black races exist permanently side by side within a highly developed civilization. For over half a century the Southern states of America have been a social laboratory, where one might study racial action and reaction. I shall not attempt to discuss the history or psychology of race prejudice. The shortcomings and the progress of the colored people, or of the white South, the present status of the Negro problem in its various aspects—all this in itself is beyond our province. I merely gather some of the more striking evidence which shows how two distinct groups, forming part of the same society, constantly react on each other.[1]

As a Southern health officer says: "We face the following issues: First: One set of people, the Caucasian, with a normal death-rate of less than 16 per thousand per annum, and right alongside of them is the negro race, with a death-rate of 25 to 30 per thousand. Second: the first-named race furnishing a normal, and the second an abnormal, percentage of criminals. . . . The negro is with you for all time. He is what you will make him, and it is 'up to' the white people to prevent him from becoming a criminal, and to guard him against tuberculosis, syphilis,

[1] I attempt no general bibliography for this chapter, largely because recent events have made previous studies out of date. In addition to the authorities quoted in the text, I mention only the charming introduction to Southern sociology: Mrs. L. H. Hammond's *In Black and White*, 1914.

etc. *If he is tainted with disease, you will suffer; if he develops criminal tendencies, you will be affected.*" [2]

Some ten years ago, a certain large city of the South voted $100,000 of bonds for a sewerage system. No sewers were placed in the Negro section, on the ground that the colored people would not have sense enough to use them. The next year a serious epidemic of typhoid fever visited the city, taking its rise in this same Negro district. Additional sewers were then installed.

In other lines the come-back, if not as rapid, appears to be equally sure. We find it in sexual relations. Intermarriage of blacks and whites, which in general neither race desires, is forbidden by all the Southern states. Open concubinage has practically ceased, under pressure of public opinion. But the intense sentiment against the mixing of the races, reinforced by lower motives, has brought it about that a Negro girl cannot obtain legal redress from the white man who ruins her, or support for his bastard child. This situation adds immensely to the strength of the white man's temptation. He knows that he need not fear the penalties against adultery and fornication, which the law provides in the case of white women. The South's greatest danger to its morals lies in this illicit admixture of the races, this double standard of sexual relations, which has been brought about by the outlawing of Negro women. "In view of the vital connection between the morals of the two races, the moral regeneration of either must of necessity include both." [3]

The effect of this situation on Negro men is more than the force of example, which leads to further debauching of colored women. They must share the women of their own race with their white rivals, while the women of the dominant race are kept from them by the triple wall of law, public opinion and masculine sentiment. A sense of

[2] Quoted by Wm. Archer, *Through Afro-America*, 1910.
[3] Archibald H. Grimke, *The Sex Question and Segregation*, Am. Negro Academy, Dec., 1915.

sullen resentment leads some of them to endeavor to climb that wall, by the dark and crooked ways their white instructors have shown. Hanging like a pall over the white South is the fear of such assaults on women and girls by brutal black men.[4]

Lynching, the remedy attempted for this very real danger, brings us to another instructive case of action and reaction. The summary execution of desperate white men is familiar enough under frontier conditions, where legal machinery is not available. As a method of dealing with Negro criminals, it appears to have been fastened on the South by the Ku Klux Klan. The primary object of lynching, according to its defenders, is to prevent by intimidation the crime of rape. The effect has been the exact opposite. "The facts as known," says Cutler, "indicate that lynching for assault upon white women, instead of having a repressive influence, has directly stimulated its perpetration. Assaults on white women have occurred again and again immediately following a lynching for such crime, and they have so occurred in the same neighborhood where the lynching took place. It has been publicly stated that in one instance a negro who had witnessed a lynching for this crime actually committed an assault on his way home." [5] Following the Atlanta race riot, which caused extreme and widespread terror among the Negro population, several assaults on white women occurred. Civilized nations have learned, by bitter experience, the truth of this psychological law, that "severe punishments, especially if publicly executed, tend to increase crime." [6] Sir Sidney Olivier, commenting on the complete absence of assaults on white women in Jamaica, where the blacks outnumber the whites 50 to 1, attributes the situation in the Southern states to "the constant storm of suggestion

[4] *Cf.* Ray Stannard Baker, *Following the Color Line*, 1908, chap. 1.

[5] James E. Cutler, *Lynch-Law*, 1905, 224.

[6] Henry P. Fairchild, *Unpartisan Review*, No. 27, 15, 1920.

to the most imaginative and uncontrollable of passions in an excitable and imaginative race." [7]

Mob violence, the habit of taking the law into their own hands, tended to grow by what it fed on. It spread to other crimes than rape. When we examine the lynching record in the United States for the 30 years from 1889 to 1918,[8] we find that, of 2,522 Negroes lynched, only 28.4% were put to death for real or alleged assaults on white women. Of the remainder, 35.8% were charged with murder, 9.5% with other crimes against the person, 8.3% with crimes against property, 12% with miscellaneous crimes, and 5.6% were lynched for other than criminal offenses. During this period, 50 Negro women were lynched. Taking five year periods, the proportion of Negroes lynched for assaults on white women has steadily declined, from 31.8% in 1889-1893, to 18.9% in 1914-1918. While the total number of lynchings has decreased, the character of the mobs has deteriorated, and the punishments inflicted have tended to increase in severity. In 1919, out of 78 cases, 11 were burned to death, 1 drowned, 1 cut to pieces, 1 beaten to death, and the rest hanged or shot; 3 of these were burned after death. It is a frequent practice to torture the victim before death comes to his relief. No one can read in detail the story of a typical lynching, often witnessed by women and children, without realizing its degrading influence on those taking part in it, the supplanting of reason by passion, the cheapening of human life, the encouragement to anarchy in all civil relations. The reaction of lynching on the dominant race is seen in the fact that 702 whites, 11 of them women, were lynched during the same period. Of these 425 were in the South. One of the most notable cases was that of Leo Frank, in Georgia, in 1913. Accused, probably without reason, of murdering a girl employed in his pencil factory,

[7] *White Capital and Coloured Labour*, 1906, 50.
[8] *Thirty Years of Lynching in the U. S.*, Nat. Assoc. for Advancement of Colored People, 1919.

the strength of the mob spirit prevented a fair trial. After his sentence had been commuted to life imprisonment by Gov. Slaton, 25 "selected" men broke into the penitentiary, took him in an automobile to a spot near the murdered girl's home, and hung him. No action was taken by the grand jury to which the lynching was referred.

Civil justice for the Negro population has been equally difficult to secure, in many sections. This is particularly true under the share-cropping system, where land, implements and supplies are furnished by the landlord, and at the end of the year the crop is divided on equal shares. In 1918, at Keo, Lonoke Co., Arkansas, "a Negro by the name of George Conway, raised 20 bales of cotton, the value of which was $3,500. His landlord refused to furnish him shoes or clothing, so that he was forced to work his crop barefooted and often hungry. The worker's family consisted of himself, a wife, and two children. Although the value of the goods he 'took up' did not amount to more than $300, when he asked for an itemized statement at the end of the year he was told his purchases amounted to $40 more than the value of his crop. When he demanded a settlement and an itemized statement his landlord beat him severely and threatened to kill him if he persisted in his demand. For the $40, balance due, the landlord seized the Negro's household goods and drove him off the plantation, penniless." [9]

The effect of such conditions on the white South may be traced in at least three directions. In the first place, the exploitation of the Negro means the moral degradation of the white. As Murphy puts it, "The chief sufferer is not the weaker group, but the group thus afforded a rich support for its coarser elements and its lower tendencies—elements and tendencies which a normal and homogeneous life might more effectively dislodge or modify. Low standards in the services rendered by the negro to the community are not so serious as the low standards of service

[9] Walter F. White, *Survey*, 233, Dec. 13, 1919.

he exacts; low grades of goods, cheap, adulterated qualities of food, poor houses at high rents, petty loans at extortionate interest, top-heavy mortgages that embitter the victim and harden the heart of the lender;—a constituency, which, however innocently, will float the less efficient or less creditable element thrown off from the commercial or professional life of the stronger group; the declining merchant annexing a negro trade, the discredited lawyer annexing 'negro business.'" [10]

A second effect has been the increase of racial tension. Negro race consciousness, which had been slowly developing in the better educated and more prosperous groups, was spread and matured through participation in the War. Colored people came to insist more generally on their legal rights. As Professor Morse has said, "There is a new Negro in the South, the product of five years of human struggle which are easily the equivalent of any hundred earlier years of human history. We shall prove the quality of our education by our willingness and ability to adjust ourselves to him." [11] The process of readjustment has not been easy for either side. The new self-assertion of the Negro led to renewed attempts at intimidation and repression, the Ku Klux being revived in many sections. As a consequence, Negroes armed themselves in self-defense, and armed clashes became more frequent. Outside of Arkansas, where the whites greatly outnumber the blacks, recent race riots have been battles, not massacres. The old spectre of an armed insurrection of the Negroes has come back to haunt the white South.[12] Not only have many colored folk been disillusioned by the experiences of the War and after, but a radical left wing has developed, under the leadership of the *Messenger*.

[10] Edgar Gardner Murphy, *Basis of Ascendency*, 1910, 124 *ff*.
[11] *Sewanee Review*, Apr., 1920.
[12] Herbert J. Seligman, *The Negro Faces America*, 1920, 56, 69. In *The Voice of the Negro*, 1920, Robert T. Kerlin gives excerpts from the Negro press for the four months following the Washington riot. The book is a notable attempt to study racial reactions.

Our handling of the race problem is producing a reaction like that from industrial exploitation, with which in many parts of the South it is closely related.

The third form of reaction, though second in point of time, was the migration of Negroes from the South. Definite movements took place to Kansas in 1879, and to Arkansas and Texas in 1888-9. These were followed by a slow shifting of Negroes from the Black Belt to newer sections of the South, and to Northern towns and cities. In 50 years this northward movement transferred about 4 per cent of the entire Negro population. The migration of 1916-17 was unprecedented in volume. Over 400,000 Negroes, from all parts of the Southern states, moved north. As in the earlier movements, the fundamental cause was economic. The Negroes left their old home to better their condition, like the emigrants from Europe. A serious agricultural depression in the South, at the beginning of the European war, coincided with the stopping of European immigration to the North and the unprecedented demand for labor. All students of the Migration, however, recognize that a strongly contributing factor was the fear, resentment and restlessness provoked by the treatment Negroes had been receiving in the South. The exodus from South Carolina, for example, was started by the lynching of a wealthy Negro, Anthony Crawford. The following report comes from Mississippi: "The police of most of the cities are rough and indiscriminate in their treatment of negroes. At the depot during the summer, on several occasions, negro porters were severely beaten by policemen for trivial reasons. This, it was said, started a stream of young men that cleaned the town of porters." When a labor agent could offer not only big wages, but good schools, decent living conditions, fair treatment, and freedom from intimidation and repression, his appeal found ready listeners. Once started, the movement gathered its own momentum. Whole communities caught the

"northern fever." Individuals who had gone north, wrote back urging their friends to join them.

The Migration brought a race problem to the North, largely economic in character, which is too complex to discuss here. Our study in this chapter is confined to racial action and reaction in the South. The sudden draining from that section of a considerable portion of its Negro labor was extremely serious. "Homes found themselves without servants, factories could not operate because of the lack of labor, farmers were unable to secure laborers to harvest their crops." The Macon *Telegraph,* which a few months before had advocated sending 100,000 worthless Negroes to Mexico, said of Negro labor: "If we lose it, we go bankrupt." At first, drastic measures were taken to check the migration. Solicitation by labor agents was prohibited. Individual Negroes were arrested. Crowds waiting for trains were roughly handled by the police. Stories were circulated as to the cold weather in the North, and the spread of sickness among the migrants. When it was found that such a policy only served to stimulate the movement, Southern leaders, of all shades of opinion, began to recognize the common interest of the races, and take steps to remedy the causes of the migration. It is easy to exaggerate the extent of this change, but some of the measures attempted are very suggestive. Wages were raised to a point that would hold Negro labor in the South. Plantation work in many places was put on a fairer basis. Improvements were made in the condition of Negro districts in the cities. Newspapers, often by a bold about-face, deprecated lynchings and suppressed details of mob violence. Petty tyranny by police and court officials was discountenanced. Joint meetings of white and colored leaders were held for a frank discussion of grievances.[13]

[13] Emmett J. Scott, *Negro Migration during the War,* 1920; *Negro Migration in 1916-17,* U. S. Dep't Labor, 1919. The movement for inter-racial committees has spread until it includes over 800 counties in the South.

In the comprehensive study of Negro Education made by the Government in 1916,[14] it was found that the Southern states were spending $2.89 for each Negro child as compared with $10.32 for each white child. The attendance in both public and private schools included only 58.1 per cent of the children from 6 to 14 years of age. In practically all of the states the average school term was less than five months. The wretched condition of the school buildings was matched by the lack of supervision, and the failure to adapt the course to community needs. Teachers were poorly paid. Their average preparation represented less than eighth grade work in school. Provisions for secondary education were equally deficient. Only 24,189 pupils were enrolled, half of them in private schools. These included students who were being trained as elementary school teachers. In colleges, 1,643 were studying college subjects, and 994 taking professional courses. Outside of Hampton and Tuskegee, adequate facilities for industrial and agricultural training were found in only 16 schools, largely maintained by Federal funds.

The moral danger and economic loss in an undisciplined and unskilled Negro population of 9 million (38% of the total) is beginning to dawn on the white South. As the Southern University Race Commission expressed it: "The inadequate provision for the education of the Negro is more than an injustice to him; it is an injury to the white man. The South cannot realize its destiny if one-third of its population is undeveloped and inefficient. For our common welfare we must strive to cure disease wherever we find it, strengthen whatever is weak, and develop all that is undeveloped. The initial steps for increasing the efficiency and usefulness of the Negro race must necessarily be taken in the schoolroom. There can be no denying that more and better schools with better trained and better paid teachers, more adequate supervision, and longer terms are needed for the blacks as well as the whites. . . . Our

[14] Bur. of Education, *Bull. 38*, 1916.

appeal is for a larger share for the Negro on the ground of the common welfare and common justice. He is the weakest link in our civilization, and our welfare is indissolubly bound up with his." [15]

Agriculture is still the main industry of the Southern states. Much land remains to be reclaimed, and only 42 per cent of the area in farms is improved. Of nearly a million Negro farmers, about a quarter own their own farms, the balance being cash or share tenants, or farm laborers. Since these Negroes make up two-fifths of all persons engaged in agriculture, it is evident that the economic wealth of the South depends very largely on their training and general intelligence. By the use of machinery and better farming methods, it would be possible for them, as Work says, to double not only the acreage under cultivation but the yield per acre, growing two bales of cotton instead of one, 50 bushels of corn where 17 are now grown, and 150 bushels of sweet potatoes in place of 88.[16]

Other economic aspects of the situation are coming to the front, for example the question of public health. Southern labor shortage has been likened to "a water famine in a community which permits big holes in its reservoir." According to the 1910 census, out of every 100 Negro males born alive, 22 died within the first year, as compared with 12.3 for the whites. At birth, where a white boy's expectation of life was 50 years, a Negro boy's was 34 years. Given a Negro population of 9 million, the size of this leak in the South's productive labor force may be readily calculated.[17]

The Negro problem may be viewed from the standpoint

[15] *Open Letter to College Men of the South*, Sept. 1, 1916. Notable progress is being made along these lines in every Southern state, and school statistics gathered today would make a much more favorable showing.

[16] Monroe N. Work, Tuskegee, *The South's Labor Problem*, South Atlantic Quarterly, Jan., 1920.

[17] Coöperative health campaigns are being carried on with marked results in a number of states, notably Virginia, Maryland, North Carolina and Texas.

of the storekeeper or manufacturer who has goods to market. Commenting on the move for racial coöperation by the Pine Bluff (Ark.) Chamber of Commerce, the *Manufacturer's Record,* one of the most influential publications in the South, said: "When you put before the Negro the hope of acquiring the conveniences of modern life, you touch his nerve of industry and put a power behind his hoe that never was there before. The prosperity of the South is wrapped up in the prosperity of the Negro. Not by millions, but by billions, will the wealth of the South be increased when the Negro demands, not a hut, but a house; not a cot, but a bed; not rags, but store clothes. . . . The shiftlessness of the Negro has cost the South hundreds of millions of dollars."

The refusal of Southern labor unions to admit Negroes has been due partly to race prejudice, partly to the fear of competition from those with a lower standard of living, who were willing to work for less. The latter factor is rapidly being eliminated. The Migration to the North gave to Negro labor a new economic value, and the chance to make good in many trades. In some places, circumstances are already compelling white labor to recognize the law of common interest. At Bogalusa, La., are located the saw, pulp and paper mills of the Great Southern Lumber Co., probably the largest lumber producers in the United States. The company has strenuously opposed the organizing of its workmen. Beginning about three years ago, the white workers succeeded in forming unions. The company then began the systematic discharge of white union men, putting non-union Negroes in their places. This forced the hand of Labor, and a campaign was begun to unionize the Negroes in the company's employ. On Nov. 22, 1919, three white union men, one of them district president of the American Federation of Labor, were shot by the company's henchmen, and a number of others wounded, for protecting a Negro organizer.[18]

[18] Seligman, *op. cit.*, 196 *ff*, 311 *ff*.

I have given these examples with only explanatory comment, leaving the reader to draw his own conclusions as to the Negro problem and its solution. The facts bear witness to a general social law, whose application is far wider than the color line. Wherever two "races" are in intimate contact, they have common moral and economic interests, which cannot be ignored without serious consequences. If the two differ in culture, the lower must be lifted to the level of the higher, or the higher will inevitably deteriorate. Attempts at oppression or exploitation, whether perpetrated on the Negro in America, the Pole in Silesia, the Jew in Russia, or the Slav in Hungary, bring dangerous and costly reactions, because they violate a law of the Universe. In the words of a great teacher: "We are members one of another. No man liveth unto himself, and no man dieth unto himself."

XXIV.

THE GROWTH OF COMMON INTEREST.

The weakness of the competition theory of national relations when examined from the economic standpoint, and the studies we have made of racial action and reaction leave the field in possession of Jesus' principle of common interest, as grounded in a righteous and altruistic Universe. The story of the human race is the record of incomplete adjustment. History's awful tragedies, like so much in the unfinished Creation, must be laid at the door of man's failure to understand the Universe, to comply with its conditions and coöperate with its moral forces.

It remains for us to consider the foundations already laid for a better adjustment and a more successful world order. Circumstances are forcing the nations to recognize the principle of common interest. Few people realize how far the unification of the world has gone. The rapid growth of communication during the 19th century compelled countries to give up their isolation, and in many directions their right of independent action. With the passage of men and goods across national boundaries, countless joint interests were formed. The world has been bound together by a network of associations, of which only the more important can be noted here.[1]

Health has come to be an international interest. Even a rigid quarantine has not been sufficient to make microbes and their carriers respect national frontiers. Reference

[1] See L. S. Woolf, *International Government*, 1916; Francis B. Sayre, *Experiments in Internat. Administration*, 1919; Paul S. Reinsch, *Public Internat. Unions*, 1911.

was made in an earlier chapter to the problem of yellow fever. For many years New Orleans and the Mississippi Valley were ravaged by this disease, brought by vessels from foreign ports. The sanitary conquest of Havana and Panama called attention to the seed-beds of infection in Central America. In 1919, Nicaragua, Salvador, Guatemala and Honduras united for the elimination of yellow fever, which only international coöperation could have accomplished.

During the last hundred years, cholera, like its predecessor bubonic plague, has been spreading to Europe from southern Asia. Each great epidemic was followed by an International Conference, which attempted to devise protective measures. In 1892, an agreement was secured by which each nation was obliged to give notification of the outbreak of cholera, and to provide facilities for the handling of actual or suspected cases. International sanitary councils have been established for Turkey, Egypt, Persia and Morocco. These are intended to combat the spread of disease through the annual Mohammedan pilgrimage.

In recent years two new epidemics, influenza and infantile paralysis, have become a world problem. Dr. Simon Flexner locates the endemic home of infantile paralysis in northwestern Europe, and that of influenza in the border region between Russia and Turkestan. The epidemic waves radiate from these foci. In view of the difficulty of combating these diseases when they have spread over wide areas, he proposes a concerted attack upon them in the original centers of infection. The object would be to destroy the natural seed-beds, as in the case of yellow fever.[2]

The health of other countries has an economic phase. That nearly 100 per cent of the workers on coffee plantations in Brazil and tea estates in India and Ceylon are infected with hookworm, may seem a fact of sympathetic but remote interest. Medical treatment of the disease makes a

[2] *J. of Am. Med. Assoc.*, 73, 949, Sept. 27, 1919.

difference of from 25 to 50 per cent in the efficiency of labor. A group of laborers in Costa Rica, for example, who before cultivated 563 acres of coffee, were able to cultivate 750 acres. The control of hookworm therefore affects the cost of each cup of tea or coffee that is used the world over. The same holds true of every line of production and every aspect of public health. One of the great obstacles to the economic reconstruction of Central Europe has been the spread of typhus and other diseases in the wake of war. As Folks said, in regard to the general public health situation: "In 1914 the millennium was on its way. It was not at the door, but it was definitely predictable. The war has postponed it indefinitely." [3]

Among the first steps taken by the League of Nations was the opening of an International Health Office at Geneva, intended to take over the Office of Public Health established at Paris in 1907. The International Health Board of the Rockefeller Foundation coöperated in 1919 with 17 nations or colonies. In the summer of that year, a League of Red Cross Societies was formed, to correlate the public health work of 26 nations. Agencies of destruction may be developed by each country in secret. Remedial measures are open, and free for all the world.

Medical, scientific and social research is a common enterprise of the race, for which national boundaries have no meaning. International groups of specialists or reformers are constantly holding meetings to discuss specific problems. The year before the War saw no less than 174 international congresses. The annual of *La Vie Internationale* listed 371 associations of this character. "Practically every profession, from engineers and architects to nurses and commercial travellers, is represented. Industry and commerce, from Chambers of Commerce to bird-fanciers and cinematograph film makers; labor in some forty separate International Federations; Science, from the powerful Electrotechnical Commission to the Interna-

[3] Homer Folks, *The Human Cost of War*, 1920, 277.

tional Society for Psychical Research; Medicine, with as many as thirty-nine distinct associations; Art, Literature, Learning, and Religion have all entered the field of international organisation. Finally, there are innumerable associations of persons working for some special social object, like Women's Suffrage, Temperance, or the suppression of prostitution, and who are seeking to attain that object by international action. In this division Morals, Education, and Feminism provide the largest numbers, but the catholicism of internationalism is well shown by the existence of an 'International Association for the Suppression of Useless Noises' and an 'International Association for the Rational Destruction of Rats.' " [4]

Religion is a binding force between nations. Even with the unfortunate doctrinal divisions of Christendom and the alienation of certain classes, the Western nations possess a common heritage of ideas and ideals. They read the same Bible and call on the same Savior. Every important body of churches is represented in more than one country. Though nationalism affected the churches during the War, as it did every form of association, the spirit of Christianity is an influence working strongly for sympathy and coöperation. In organized movements for World Peace there are three principal elements: Feminism, Labor and the Christian Church. And the greatest of these is the Church.

McDougall, in his *Social Psychology,* calls attention to the way Art tends to soften and socialize national relations. Not only is there a constant interchange of artists, and imitation of foreign artistic models, running all the way from architecture to fashion in dress. A common admiration binds the Western world together. The great works in literature, painting or music belong to the race, rather than to the nation which produced them. The tourist, in his pilgrimages to famous shrines, is a true cosmopolitan.

Even Sport has become international. Since 1844, when

[4] Woolf, *op. cit.*, 106.

George Seward, an American professional runner, visited England, such competition has become increasingly frequent between English-speaking peoples. During the past summer, America welcomed French tennis players, a French pugilist, and a Japanese base-ball team. The Olympic Games were revived at Athens in 1916, and are held every four years in a different country. The seventh of these contests occurred at Antwerp in 1920, national teams winning points as follows: United States 212, Finland 105, Sweden 95, Britain 92, France 35, Italy 28, South Africa 24, Canada 10, Norway 10, Denmark 9, Esthonia 8, New Zealand 5, Belgium 5, Australia 5, Holland 2, Czecho-Slovakia 3, Luxemburg 1.

The modern development of Trade and Credit has made the nations of the world mutually dependent. They have shared, as a common trust, the remarkable technical advances which have made possible the cheapening of production and transportation, the diversifying of consumption, and the expansion of commerce. Man, as E. B. Andrews said, is a particularist in production and a universalist in consumption. The mineral resources of the world are widely distributed. Variations in climate and natural products are paralleled by differences in aptitude and skill. The needs of the nations have come to be reciprocal.[5]

Each country therefore looks to other countries for the supply of needed goods and the marketing of its own surplus. Economic conditions abroad affect its own ability to buy and sell. Bad weather in the cotton states of America raises the price of cotton on the Liverpool market, and reduces the number of hands employed in English textile mills. Good crops in the Argentine mean good business for American makers of machinery. Such fluctuations in trade conditions are registered throughout the world in the daily quotations on produce, stocks and monetary ex-

[5] Elisha M. Friedman, *Internat. Commerce and Reconstruction*, 1920, 86.

change. Even in times of peace, cyclic fluctuations occur at frequent intervals. In a period of general prosperity, business optimism and the expansion of industry and credit spread from nation to nation; prices and wages rise the world over. There ensues a period of business depression, when bankers throughout the world curtail their credits, factories close down, and millions of men and women are thrown out of work. If, for rhetorical purposes, Society is likened to a living organism, the international banking system is the upper brain, the mind whose confidence or caution alters the circulation of blood to every cell.

The World War gave abundant illustration of this dependence of one nation on another. Americans have a realizing sense of the way events in a different hemisphere alter their cost of living and means of employment. The dislocation affected the entire world. Goods formerly purchased from the Central Powers must be obtained elsewhere. Non-essential production was curtailed by the Allies, and imports increased at the expense of the customary exports. Trade routes were shortened and redirected. Countries formerly dependent on Europe for their manufactures were compelled to seek new sources of supply or develop substitute industries. While the Allied and neutral nations suffered inconvenience and hardship, the Central Powers found economic isolation fatal. The blockade, which erected dams across the ordinary channels of foreign trade, killed more people through starvation and lowered disease resistance than lost their lives in battle.

At the close of the War, the Allies faced the problem of an economically prostrate Germany. To degrade her permanently from a trading to an agricultural nation, with the loss of a third of her population, might satisfy the demands of retributive justice. But such a Germany could not pay her bill for damages. And she would cease to be a heavy buyer of goods from Allied countries. No nation can prosper unless its trade rivals are prosperous, because

its rivals are customers as well as competitors. Threats of a trade boycott died down before the fact that in 1913 the four Central Powers bought from Great Britain $400,000,000 worth of merchandise, from France $150,000,000, and from the United States $375,000,000.[6] The background of the Disarmament Conference, which is in session as I write, is an economic prostration so complete and so universal as to compel the attention of the most chauvinistic diplomat.

Tariff wars have proved costly experiments. In the early 90's, France raised her rates on Swiss goods approximately 40 per cent, and Switzerland retaliated. The conflict lasted for two years and a half. "France's losses in this trade war were heavy. The diversion of Swiss commerce to other countries lost to her millions of francs in railway receipts, ocean freights, and commissions. Austria, Italy, and the United States gained at her expense in the sugar trade, Spain in the wine trade, Italy in the silk trade, Germany and Belgium in metal goods, and the United States in leather. Germany received half of the trade lost by France in ready-made clothing and one-third of that lost in woolen goods. Not until seven years after the close of the trade war did French exports to Switzerland again equal the exports of the normal years before the trade war." [7]

Emigration is another phase of the same world problem. To equalize the pressure of population, "men must move or goods must flow." The economic development of the Far East, for example, is likely to cause a situation of increasing international strain. "If the yellow race," as Friedman says, "is to remain out of the white man's lands—and biologically it appears desirable to prevent

[6] Friedman, *op. cit.*, 109.

[7] Wm. S. Culbertson, *Commercial Policy in War Time and After*, 1919, 264. The present tendency appears to be to adopt bargaining tariffs, which, while preventing discrimination and dumping and guarding key-industries, will secure concession from other countries and foster rather than hinder the freedom of trade.

fusion and to preserve the distinctive characters of each —the flow of raw materials must be unrestricted and the movement of finished goods not too greatly obstructed." [8] The militant alternative is not pleasant to contemplate.

In the interests of communication and trade, the nations of the world have been led to establish such international governments as the Universal Postal Union and the Telegraphic and Radiotelegraphic Unions. A European Convention regulates the shipment of goods on continental railways. The Automobile Convention of 1909 issues international licenses and arranges for uniform signpost marks. International commissions control the navigation of the Danube and the Rhine, and many other rivers have been opened to world trade by common agreement. The Sugar Union, formed in 1902, binds the principal European countries to abolish sugar bounties, and excessive import duties on this staple. The International Institute of Agriculture, with headquarters in Rome, is of special interest, as the official delegates of the various governments were allowed to continue their service throughout the War. The Institute issues monthly bulletins on plant diseases and crop statistics. The aim of its founder, Mr. Lubin of California, was to protect the farmers of the world from exploitation through excessive freight rates and the cornering of food markets.

The investment of money has little reference to national boundaries. The bonds of foreign governments and municipalities are marketed as readily as those of one's own land. Capital reaches out for a share in factories or railways or oil wells on the other side of the world. I open my New York paper and am offered securities in Canada, Newfoundland, Mexico, Costa Rica, Dominica, Chile, Brazil, the Argentine, China and Japan.

The common interests of Capital have found expression in world-wide federations of Chambers of Commerce, and

[8] *Op. cit.*, 17. *Cf.* Edwin C. Eckel, *Coal, Iron and War*, 1920, part 4.

of many commercial groups. The International Maritime Committee, for example, made up of associations of shipping men in the principal maritime countries, has been able to secure uniform laws in regard to salvage and collisions. It is now working to obtain international agreements on safety at sea and the through shipment of freight. Other associations have been engaged in standardizing terms and units, as in the electrical industry, and the methods of testing materials or analyzing food stuffs. International standards have been found necessary for large-scale production and the full development of world trade.

But the merging of national in international interests has gone very much farther than the question of standards. The ship owners in countries bordering on the Baltic and White Seas found that unregulated competition was cutting freights to the point where wood was being carried at a loss. A Conference was formed in 1905, representing considerably over half of the tonnage interested in the trade, only the smaller ship owners remaining outside. Each year the members meet to fix a binding minimum tariff. Before the War, international trusts and trade agreements controlled the production and sale of a long list of products, from potash and platinum to tobacco and steel rails.

During the War the Allies found it necessary to pool their industrial resources and means of transportation. International regulation of trade, and even allocation of fuel and raw materials, has been proposed as a permanent policy. Thus far the organization of the League of Nations has followed very different lines. But it was interesting to have La Fontaine of Belgium says, in the first League Assembly: "I consider the earth as a property unique in integrity, from which humanity as a whole must derive full advantage in equal measure."

Labor is an international interest. Labor groups of different countries are in constant communication, and deeply influenced by one another's programs or successes.

Under normal world conditions, workmen have more in common with the workmen of another nation, than they have with the employers of their own nation. Socialism has been international, in the name and spirit of its various organizations. The Trade Unions of the world were federated in 1901, and national boundaries are crossed by many organized groups. Take, for example, the International Metal Workers' Federation, with a membership of over a million. One of its aims is to prevent undercutting of wages from country to country. Woolf gives the case of a firm of silversmiths in Brussels seeking workers in Birmingham. The latter asked the British Section of the Federation to find out whether the firm in Brussels was "fair." The required information was at once obtained from the Belgian Section, and forwarded to Birmingham.

Governments have been forced to recognize a common labor problem, not only in such a cosmopolitan interest as ocean carriers, but in all lines of productive activity. No attempt has been made, except through protective tariffs, to guard against competition from countries with lower wages and living standards. This matter tends to adjust itself, as in the great increase of wages in Japan with the rise of industrialism. International labor legislation has rather attempted to standardize working conditions, and thus guard progressive nations against competition that would be demoralizing at both ends. The International Association for Labour Legislation [9] has been able to secure the adoption of two Conventions. The first, signed by 13 States, including the chief industrial countries of Europe, prohibits night work for women between 10 p. m.

[9] Another powerful agency is the International Association to Combat Unemployment, which numbers among its members "8 governments, 17 national official bodies, 8 provinces, 2 federations of towns, 59 towns, 14 official municipal bodies, 3 fédérations nationales de placements, 12 bourses de travail, 12 fonds du chômage, 3 international associations, 15 scientific societies, 6 national federations of employers, 3 professional federations, 4 local federations, 30 Labour federations, and individuals belonging to 23 different countries."

and 5 a. m. The second, designed to prevent the use of the deadly white phosphorus in the making of matches, has been ratified by the principal manufacturing nations, with the exception of Sweden and Japan.

An International Labor Office and Labor Conference were established by the Peace Treaty, under the following Preamble: "*Whereas,* the League of Nations has for its object the establishment of universal peace, and such a peace can be established only if it is based upon social justice; *and whereas,* conditions of labour exist involving such injustice, hardship and privation to large numbers of people as to produce unrest so great that the peace and harmony of the world are imperilled; and an improvement of those conditions is urgently required: as, for example, by the regulation of the hours of work, including the establishment of a maximum working day and week, the regulation of the labour supply, the prevention of unemployment, the provision of an adequate living wage, the protection of the worker against sickness, disease and injury arising out of his employment, the protection of children, young persons and women, provisions for old age and injury, protection of the interests of workers when employed in countries other than their own, recognition of the principle of freedom of association, the organisation of vocational and technical education and other measures; *whereas* also the failure of any nation to adopt humane conditions of labour is an obstacle in the way of other nations which desire to improve the conditions in their own countries; *the High Contracting Parties,* moved by sentiments of justice and humanity, as well as by the desire to secure the permanent peace of the world, agree to the following": permanent organization specified, which is in active and efficient operation.

The International Labor Conference held its first meeting at Washington, in the summer of 1919. Of 123 delegates present, from 35 nations, 73 were appointed by their respective governments, 25 represented employers, and

25 represented labor. Six draft Conventions were approved, and recommended to the several nations for adoption. These covered hours of labor, unemployment, night work for women, the employment of women before and after childbirth, and night work for young workers. As described by M. Albert Thomas, the Director of the Labor Office: "The Conference gives definite shape to social reforms of international scope to which national legislatures may give the force of law. The real compelling force behind the conventions and recommendations of the Conference . . . is that of public opinion in every country." [10]

When we consider the world politically, underneath the apparent conflict of national interests there is a growing community of interests. Commercial relations are possible, only where protection is afforded to the person and property of citizens residing or doing business in another country. The ocean is a common highway. To assure its free use for peaceful commerce, even in time of war, is one of the world's most pressing problems. We are threatened by the disorder and lack of development in the same backward countries, tempting the adventurer and the exploiter, who appeal to their national flags for protection. Such a thing as national isolation is no longer possible. Events on the other side of the globe may involve us in diplomatic controversies and the possibility of war. The quarrel between Austria and Serbia drew in one country after another, until half the population of the world had taken sides. The United States, which had prided itself on its freedom from entanglement in European politics, found its own house threatened by the conflagration, and was

[10] *Labour as an International Problem*, ed. by E. John Solano, 1920, 263. These essays, with the appendices covering the Labor section of the Peace Treaty, and the agenda of the Washington and Geneva Conferences, will repay careful study. Some other angles to the discussion are supplied by I. F. Ayuwasa, *Internat. Labor Legislation*, 1920; *Hist. Survey of Internat. Action Affecting Labor*, U. S. Bur. of Labor Stat's, *Bull. 268*, 1920; *Internat. Labor Legis. and the Soc. of Nations*, Bull. 254, 1919.

obliged to mobilize four million soldiers to help put out the fire in Europe.

The growing body of International Law is a recognition of the common political interests of nations in their dealings with each other. It began with custom and precedent, which students from Grotius onward attempted to put into the form of rules and principles. During the last hundred years, treaties and conventions have given the law of nations a constantly more definite basis. European Conferences, from the Congress of Vienna in 1815 to the meetings at the Hague in 1899 and 1907, were "rudimentary International Legislatures." When 41 sovereign States, for example, ratified the revised Convention of 1907 for the conduct of land warfare, they surrendered to that extent their freedom of action, in order to eliminate unnecessary barbarity and suffering. The Convention limiting the employment of force for the recovery of contract debts has been ratified by the principal commercial nations. Mention has already been made of other important Conventions governing common action in time of peace. The complaint of belligerents in the recent War that international laws were being broken and international standards of ethics violated, is a strong witness to the fact that such laws and standards exist and are generally acknowledged. As Lawrence says: "The controversies of one generation produce the undoubted law of the next." [11]

The great Powers have repeatedly acted together to settle the affairs of disturbed or threatening territories. Turkey, in its relation to Greece and to the Balkans, has come in for its full share of this joint legislative and police power. Belgium was made a neutral state in 1831, and Luxemburg in 1872. The Congress of Berlin, in 1885, determined the relations of the European States to

[11] T. J. Lawrence, *Prin's of Internat. Law*, 4th ed., 1910, 15. See also L. Oppenheim, *Internat. Law*, 3rd ed., 1920; Amos S. Hershey, *Essentials of Internat. Public Law*, 1916; Wm. E. Hall, *Internat. Law*, 7th ed., 1917; A. Pearce Higgins, *The Hague Peace Conferences*, 1909, with texts of the Conventions.

the Congo and other parts of Central Africa. The Conference of Algeciras attempted to do the same for Morocco, by creating an international control of administration and trade. Map making and policing on a large scale were involved in the Treaty of Versailles. A common policy in regard to China is one of the principal agenda of the Disarmament Conference.

A start has been made toward an international Judiciary. The Permanent Court of Arbitration, proposed by the First Hague Conference, was ratified by 44 nations, representing 91 per cent of the world's population. It maintains a list of available judges, selected by the signatory powers. Nations which agree to bring a case before the tribunal, select four judges from this list, and these in turn name an umpire. The award, given by majority vote, is binding on both parties. At the same Conference, provision was made for commissions of enquiry, and friendly mediation by a third power. An International Prize Court was added in 1907. Fifteen judges are appointed by the signatory powers, and serve as a court of final appeal for cases already tried in their national courts. Except as provided by special treaty, arbitration is compulsory only in prize cases and those involving the collection of contract debts.[12] A Court of Arbitral Justice was proposed by the Second Hague Conference. The First League Assembly took steps to put the plan in operation. Ratification has been secured from 30 nations; 22 being the minimum required. This Court will sit permanently to decide cases brought before it, thus making arbitration simpler and more rapid.

The stupendous losses involved in modern wars, and the cost of preparedness, have led to a general demand for the proportional reduction of armaments and for some form of international insurance against war. Two recent attempts have been made to meet this demand. The first

[12] References will be found in Edw. Krehbiel, *Nationalism, War and Society*, 1916.

was the League of Nations, planned as the foundation of the Versailles Treaty. It is not necessary for me to add to the voluminous discussion of this subject. The history of the League, as a force for shaping future national relations, cannot be written before the event. Whatever its defects, and however ill-starred its birth, the world has seen the formation of an international insurance company. And it includes as its stockholders practically all eligible countries, with the exception of the United States. That the League is a going concern is shown by the references I have found it necessary to make to it in the course of this chapter, and by the number of important questions it has settled in the first two years of its life.

The second attempt, which will be completed before my book is published, is the Conference on Disarmament and Problems of the Pacific, which assembled at Washington in November, 1921, in response to the invitation of the United States government. The proposals for naval disarmament are too recent to require comment. If carried out, they will practically put an end to offensive warfare on the sea. Another notable feature of the Conference, by contrast with that of Versailles, is its responsiveness to popular sentiment. Not only have the sessions at Washington awakened a remarkable interest throughout a war-weary and tax-burdened world. The decisions to be made appear to depend largely on the current of public opinion in the various countries involved.

It is important to note that the centrifugal tendencies of nationalism are more than balanced today by a centripetal tendency toward the larger grouping of nations. No country feels strong enough to stand alone; it finds safety only in ententes and alliances. The new Baltic States are a case in point. Each is the product of a strong nationalistic movement. They had many conflicting interests, which led to actual or threatened strife. But common interest proved stronger. Hardly had peace treaties been

signed, when a Conference of Baltic States met at Riga, on Aug. 3, 1920. Representatives were present from Finland, Poland, Lithuania, Letvia and Esthonia. A treaty for compulsory arbitration was adopted, and steps taken to work out a common customs and railway policy. This centripetal tendency is likely to grow stronger in future years, because of the handicaps in economic isolation.

Other centripetal tendencies are found in the fact already noted, that the grouping of both Capital and Labor is coming to be along horizontal rather than vertical lines. The larger industries have more to gain from the formation of world-wide trusts than from the pushing of exclusive national interests. Peace and good order mean increased purchasing power. Increased purchasing power in any country means a better market for the world's goods. The working class movement is strongly opposed to large armaments, secret diplomacy, and colonial exploitation. Governments have been inclined to consider the interests of individual traders and investors. But the growing strength of the workers as a political force compels increasing attention to the interests of the whole community. And in the declarations of the British and other labor groups, during and after the War, "the whole community" refers to the world and not to any single nation.

In national as in all other human relations, Man learns only through social experience. Whether he will profit by experience depends on many psychological factors. Such advances as are made are not in straight lines, or at equal rates of speed. Certain nations lead, while others lag. The idealist may grow impatient as he studies the appraisal of internationalism which I have given in this chapter. A real Federation of the World is a dream of the distant future. The diplomacy of the old school is still very much in evidence. The possibility of recurring wars is far from ended. But it is clear from the record that men, in their national groups, have begun to think in in-

ternational terms and practice world citizenship. Progress may be slow and incomplete. But we are learning to live in a social Universe, to adjust ourselves to a God of justice and goodwill. The civilized world has gone far toward recognizing the Christian principle of common interest.

XXV.

THE FUTURE.

When a traveller returns from a tour of the world, he finds it helpful to record his general impressions. We set out in this book to examine in a scientific spirit the Universe in which we live, in order to find if possible a basis for personal and social ethics. We have reached the end of the journey. In this chapter I propose to put together what I regard as the result of our search.

Jesus' idea of the Universe has proved adequate as a working hypothesis. It is a searchlight illuminating human life and history. Christianity, the climax of the long religious evolution of the race, appears from our study as an essential element in civilization. We cannot consider it a survival of superstition, or a poetical addition to human thought, which may be dispensed with in the affairs of practical life. The religion of Jesus represents a matured interpretation of the world in which man finds himself. It is the fulfillment of that instinct which leads all life, from the lowest to the highest, to adjust itself to the environment. It is the reaction of man to an essentially Christian Universe, the attitude of confidence, teachableness and enthusiasm which are necessary for the highest social development.

The interpretation of Jesus stands in sharpest contrast with the view of the Universe found in other religious systems, and in much historic and contemporary Christianity. Elsewhere we have the separation of God and the world, a completed creation, a problem of evil which

can be solved only by Divine intervention, a situation of human helplessness that gives no encouragement for hope or effort. With Jesus, on the other hand, we find a present and unescapable God, a continuous creation, God and man working together for the completion and betterment of the human world, no situation final and no evil insuperable, the future as hopeful as the character of God and the strength of our own effort. The first theory leads to pessimism and social stagnation. The Christian theory, because of its truer interpretation of the Universe and its incentive for human endeavor, is the only religion which can have permanent value for the modern world.

Jesus applies to the Universe and our relations with it the four great ideas of Spirit, Democracy, Righteousness and Goodwill.

The present is an opportune time to substitute a spiritualistic for a materialistic philosophy of life and history. The World War and the industrial conflict have opened our eyes to the practical futility of Materialism. This discovery coincides with the collapse of its theoretical basis. I ask the reader to recall the series of scientific conclusions brought out in the earlier part of our study: the new dynamic conception of Matter, the relativity of Space, the fundamental identity of the physical and organic, the perfecting of living mechanism, the gradual adjustment of man's mind to the external world. How remarkably these conclusions fit into Jesus' conception of the Universe. We are given the outlines of a consistent working philosophy. The Universe reveals the activity of a Being essentially mental or spiritual (if we may use human analogies) rather than inert or mechanical, with Whom development is a natural self-expression, and social progress a definite goal rather than an accident. From nebula to star, from sun to planet, from electron to molecule, from amino acid to living cell, from microöganism to man, we see one characteristic process of Divine unfolding, as the Universe becomes increasingly differentiated. It is not such a proc-

ess as our limited intelligence might have predicted, but far more varied and full of interest and wonder.

A fire-mist and a planet,
  A crystal and a cell,
A jelly-fish and a saurian,
  And caves where cave-men dwell.
Then a sense of law and beauty
  And a face turned from the clod,—
Some call it Evolution,
  And others call it God.

With the appearance of Man, as a conscious independent unit, the process changes, as far as our planet is concerned. An Absolute Monarchy gives place to a social and democratic Universe. After a possible intermediate stage in the case of lower organisms, the Monism which we find in the external world becomes a Pluralism, a coöperation between men and God, both in physical creation and in the development of man and society. Such a distinction is not based on abstract theory, but on our inductive study of human activity.[1] A good many philosophies have met shipwreck through the failure to note this change. They sought to explain the whole process in terms of a Monism, an Absolute, and the facts of human life stubbornly refused to fit the theory. Or they failed to grasp the idea of the external Universe as an expression of God's activity and character, the fact that, for practical purposes, God and the World constitute one whole to which man must adjust his life.

This democratic character of the present Universe is of the greatest practical importance. It gives a cosmic value to every human function and activity: reproduction, health, character building, the tilling of the soil, the achievement of science and beauty, the creation of a wholesome social environment, the participation in industrial and national relations and their proper direction. We are not called

[1] See chapters 7 to 12.

on to submit to "the bludgeonings of Chance," or to the decrees of a Divine Autocrat. We are partners in a cosmic enterprise, in which at every turn we have the opportunity to coöperate with God. To do this effectively we must learn His character and His laws. The Divine work of creation gains immensely in interest when we have a share in it, and a responsibility for the outcome. We know that our own life and the world of today and tomorrow will be what we help to make it. Our earthly existence is not "an epileptic fit between two nothings." It is the challenge of a great adventure.

It is through this partnership relation between man and God that we are able to learn the Righteousness of the Universe. There are social laws, just as truly as there are physical and biological laws. Discovered through religious experience, these principles underlying human society may be verified by observation and experiment. Our book has attempted in a provisional way to make this observation, and to sum up the result of the experiments that are available in the conduct of individuals, groups and nations. Socially the Universe grows ever more complex; but its laws have not changed. And its laws are the reflection of its character. God's laws today are what they always have been. The laws of motion were true long ages before Newton formulated them. Twenty-five hundred years ago it took a Hebrew prophet to perceive God's moral laws. But today these are evident to the man on the street, if he will open his eyes to the most characteristic features of our civilization, and the conditions of lasting success and failure.

Jesus' most pregnant discovery was that morality and goodwill are not contrary to Nature, but in accord with Nature. These motives take their rise in the primitive instincts of parenthood and association, which are as natural and dominant as self-assertion and self-gratification. In the experience and discipline of the race, morality and goodwill have become the determinative factors in human

life. The development of civilized society is due to the triumph of reason and common interest over force and selfishness. In the long run, advancement depends on the reactions which come from favorable treatment accorded to other individuals. The economic changes of the last century have greatly strengthened the idea of mutual dependence and service. Good morals are good business. The practice of honor, integrity and consideration brings definite advantage to the individual, under normal circumstances. I consider this a legitimate induction from our survey of the wide range of human activity. As to why such qualities should be an asset in daily life, the only satisfactory explanation is that of Jesus. They are grounded in the very nature of God. They are an adjustment to our Divine Environment.

That Jesus has given a true interpretation of the Universe, is confirmed by our study of industrial and national relations. All behavior has a biological basis. It represents the interaction of the organism with its environment, a response to the conditions under which its life is spent. Inherited instincts, which arose far back in evolutionary history, have been disciplined and coördinated by man's experience in society. Thus the laws of social ethics have a two-fold aspect. They represent an adjustment to the Universe and a coöperation with its physical and moral forces. They express at the same time the art of human behavior. Through all forms of association we have traced the principle of common interest. The action of one group toward another calls out responses which may be predicted with a considerable degree of accuracy. To secure goodwill, with its substantial advantages, it is necessary to consider the responses, partly instinctive, partly reasoned and ethical, on which such favorable result is conditioned. This general law of behavior holds good whether we consider the production of goods, the coöperation of subject peoples, or the political and commercial intercourse of nations. Group reactions are complicated by sentiment,

prejudice, variations in leadership, and the strength of special interests. But broadly speaking we may say that the industry or nation which substitutes dishonesty, injustice or selfishness for honesty, justice and mutual service, is violating the laws of Behavior and running counter to the Universe. Because of the solidarity of human society, and the character of the God who determines the environment for society, such a course will not only fail to attain its end. The failure will bring a dislocation and embitterment that threaten the very existence of civilization. The tragedy of the World War is not an isolated phenomenon.

How are we to define the task upon which as a race we are engaged? From a historical standpoint I doubt if it is capable of adequate definition or description. It is probable that the social order which is being developed upon our planet will always be experimental and partial, rather than fixed and ideal. From the very fact that it is developing, its outlines must of necessity change from generation to generation. We may regard the Kingdom or Republic of God as the cosmic enterprise which God and men, as far as they coöperate with Him, are working out, slowly and with infinite struggle and sacrifice, through the years of our planetary life and the unknown future. It is an achievement rather than an evolution. It is not a finished order that may be brought down from heaven to earth. It may not be even an attainable goal. It is not a terminus, but a pathway; a mountain trail up which the race is painfully climbing, guided by the stars; a growing brotherhood; a fellowship of endeavor, in which Man does not strive alone; a Divinely guided becoming of persons and societies.

In one direction, however, it is possible to make the social goal more definite. While the social order is a variable, man himself is a constant. Human society is not an organism; this analogy has been very much overworked. It is rather the organized relation of many independent organic units, gathered into groups according to their

different interests, habits and desires. From the biological standpoint, which I have tried to keep throughout our book, the objective in human life is the education of the individual in knowledge of the Universe and ability to adjust himself to it.

This position is in harmony with what our study has shown as to the importance of the human unit in relation to God. Personality is thus both the goal and the means of the creative process. For Jesus, the chief end of man is to know God and coöperate with Him. And the main object of such coöperation is the cultivation of human powers and human character. The fundamental principle of Ethics may be stated as the highest possible development of personality for the greatest number. The paradox of Christianity, that self-development requires self-forgetfulness, is a reflection of the solidarity of society. We cannot permanently raise ourselves, without raising the other environing lives that exert such an influence upon our own. An exclusive devotion to one's own training would atrophy the Christian virtues, which are primarily social virtues. Only through mutual service can we fully adapt ourselves to a social and Divine world.

A new emphasis on the individual has come with the growth of the democratic idea. It is dawning upon us that the making of tools and increase of production are valuable chiefly as they result in making better men. This is a task that is present as well as future. Our problem is not to make super-men. Fifty thousand years from now we are likely to have about the same human elements, the same instincts, the same range of intelligence quotients, to deal with. The task of each generation is to develop the latent possibilities in the men and women of that generation. By this the attainment of each age is to be judged. The degree of success which we have reached in our coöperation with God, must be measured not primarily by material civilization or the form of the social order, but by the kind of men and women which that civili-

zation and that social order are producing, in the midst of their historic development.

The limits to our enterprise appear to be set by Man rather than by the Universe. The earth gives every indication of being good for an indefinite period of social development. For at least one hundred million years our planet has kept substantially its present atmosphere and hydrosphere, temperature range, and other conditions suitable for organic life. There is no physical reason why the *status quo* might not be preserved for another million centuries. A collision with some other heavenly body is possible, but not probable. According to Arrhenius, the supply of carbonic acid gas is increasing rather than diminishing, with promise of milder climates in the northern regions and more abundant crops.[2] The fuel supply stored on the earth is undoubtedly limited. Long, however, before our coal and oil are exhausted, we shall be developing heat and power, not only from waterfalls and tides, but from the sun's rays and from intra-atomic energy. Exhaustion of our beds of iron ore might be made up by the discovery of adequate substitutes for steel. The supply of certain food elements may reach a point beyond which increase is impossible. But any limitation resulting would be on population rather than on life itself.

One aspect of the future, the immortality of the individual, I cannot discuss in detail in this volume. While a study of abnormal psychic phenomena is likely to throw light on the subject, it is impossible to weigh such evidence until we have recovered from our present hysteria over supposed communications with the dead. I have consistently avoided any definition of consciousness. The whole problem of Personality, human and Divine, is deferred to a later book. Let me remind the reader that the question of human immortality is another phase of the problem of Monism and Pluralism. It has to do with soul value

[2] *Worlds in the Making*, 61.

rather than with specific soul substance. We live in a spiritual not a material Universe. Man's body is a component part of that Universe.[3] Man's mind, on the other hand, we have been led to consider as a separate unit in the work of creation, a conscious and controlling entity. Does this independent and coöperative relation in which the human unit stands to God, continue after the disintegration of the organism? That in brief is the problem of immortal life.

If we accept the position that the fullest perfecting of the individual is the prime end of the creative process which we see going on around us, certain facts are at once apparent. Man's powers are only partially developed during his earthly existence. Studies in hypnotism and kindred phenomena give us a glimpse of vastly greater possibilities.[4] The heights of human character are attained only by the few. It is legitimate to assume, as Jesus does, that the distinct yet coöperative existence which God gives to man during his organic life, is of sufficient importance to be continued after the discarding of the bodily machine. There is nothing in the Universe as we know it that bars the way for such a faith. The average healthy-minded person believes that it is worth while for man to live. It would seem equally worth while for him to keep on living.

Our concern in this book has been with the principles underlying the success of social and political movements, rather than with predictions or panaceas. Christianity was not committed at the beginning, and cannot be committed today, to any specific plan of social and economic organization. It is acting as a powerful leaven. Whether the present order will burst or merely expand under such fermentation, remains to be seen. The shaping of the social order of the future, in the light of what we know of man in his relation to the Universe, is a problem which will demand the best intellectual effort of our own and fu-

[3] See particularly chapters 7 and 11.
[4] See my *Unfolding Universe*, 253.

ture generations. What Jesus calls the Kingdom of God is not a Utopia. It is a future hope, but it is also a present reality. It is an imperfect human society, slowly learning to adjust itself to a divine Environment. The situation is complicated by individual differences, desires, habits and prejudices. Men learn only through wide and often costly experiment. The rapid progress of the last few centuries, the slower advance of the preceding millenniums, is set in a perspective of long ages in which man's life and struggle brought only a limited and unstable adjustment to God. As social experience grows, as we become more familiar with the laws of the Universe, as this experience crystallizes into habits of thought and action, we may look forward to a more just, efficient and peaceful world. But even so, human nature will adjust itself very imperfectly to the Divine laws which underlie Society.

In the development of individual character, we must expect to meet the same frequent failure. It is this which constitutes the crucifixion of God, and of those who have caught something of His vision of the moral possibilities of man. The development of the individual, like that of the social order, is an achievement rather than an evolution. Man as an organism is complete. Man as a social unit must be made anew, for better or worse, in each generation. The tragic mistakes of human life and history are perhaps inevitable. They are a necessary consequence of the method which God follows, of revealing Himself through man's self-discipline and acquired coöperation. As far as such failures are due to the lack of personal effort and discipline, we must charge them to the moral profit-and-loss account of the Universe. On the other hand, it is the task of Society to reduce to the lowest point the failures which are due to living conditions, social environment, and the lack of proper education and guidance. Our common business is to study, and as far as possible to remedy, the fundamental causes of low standards, misery, vice and crime. In this work of social betterment, as our

study of Providence has shown, we can count on the active coöperation of the Universe. Back of our human struggles stands the Christ-like God; the Servant of Humanity, to use Isaiah's term; the All-Father of Jesus' teaching, who bears on His heart the sin and suffering of the world.

In earlier chapters we have noted in detail the part which human coöperation with God has played in the perfecting of mental and physical tools, the development of the food supply, the organizing of industry. Out of this growing knowledge of the Universe and its laws has come our vast and complex material civilization. And through the prevention of accidents and the science of bacteriology, the course of Providence is increasingly under man's control. In the field of social relations, we must humbly acknowledge our failure. The excessive optimism over human achievement, of which we may have been guilty in the early years of the century, has been dispelled by later events. No one living in 1921 would be likely to call this a well-ordered or successful world. Our failure is the failure of social science. We have not learned to know the Universe in which we live. We have misread its character. We have failed to follow the clue that Christianity has given.

The progressive social tendencies and experiments which I have outlined in the chapters on Industry are beginning to be interpreted by the study of Behavior, and will in time affect social theory. The same scientific treatment may be hoped for in the field of national behavior. The moral laws of the Universe are natural, not sentimental. They are our generalization from action and reaction in the personal sphere, as gravitation or light pressure or crystallization or osmosis are generalizations from action and reaction in the physical sphere. When we come to know and follow the moral laws of the Universe, as we have learned to know and follow the laws of physics and biology, of health and sanitation, our adjustment to God and our coöperation with Him will bring equally striking

results in industry and world politics. We shall be in a position to control social forces, as we now control physical and biological forces. In this lies the hope of the future. Along such lines we must seek a solution of the many vexing problems of the present. It is inconceivable that the race which has conquered the world through natural science, will continue to meet shipwreck through its failure to master the far simpler and equally natural science of human relations.

In this book I have treated Christianity as an intellectual interpretation of the world. But religion is more than a working hypothesis, a practical philosophy of life. The mere acceptance of Jesus' view of the Universe is not Christianity. The Christian reaction to the Universe involves a personal faith, an acting out of its interpretation of the world, an emotional response capable of immense dynamic power. Important as is Jesus' theory of a spiritual and moral Cosmos, this is overshadowed by the loyalty, the ethical and social enthusiasm, which he has been able to inspire in his followers. The remarkable feature of Christianity is not its program for human life, but its ability to realize that program.

If the Christian religion, like historical religions of earlier ages, can be made to represent the attitude of civilized peoples toward the Universe, the gain both to Religion and to Civilization is almost incalculable. The religion of authority has passed, or is passing. It is out of harmony with the modern spirit of democracy and free enquiry. But that spirit encourages and demands a religion which trusts in and coöperates with the Universe. The collapse of philosophical materialism comes at a time when we have begun to recover the Christianity of Jesus. Faith is essential to life, and religious belief and expression are the soil in which it normally grows. Our leaders in pure and applied Science, in social service and social philosophy, have frequently shown a devotion, a self-effacement, a loyalty to truth, a breadth of vision, that are truly, if un-

consciously, religious. It would be most unfortunate if such qualities and satisfactions should be limited to a few specialists. Their leadership in human progress will avail, only if the average man, whatever the degree of his enlightenment, has a child-like faith in the God who is back of all experience, the sense of a great purpose, a feeling that he is engaged in an enterprise in which all his instincts may find expression, and on whose outcome depend the issues of his own and other lives, present and to be.

Of the social value of such an attitude there can be no question. Without it, as recent events have shown, the structure of human society lacks the cement which will hold it together. Let me again emphasize what this means, from the standpoint of Biology. Whatever is of permanent value to society represents a successful adjustment of the human organism to its environment. Religious faith is true because it is necessary. It constitutes the highest form of man's adaptation to the Universe. We know that the world is a Cosmos rather than a Chaos, because no other attitude of mind will enable the race to survive.

As we look backward over the centuries, and forward to the future of the race, we may note certain features that are bright with promise. On the highway of Humanity, the marks of direction and progress which I distinguish are (1) the lengthening of human life; (2) the economic emancipation of the individual, with its outcome in the democratic movement; and (3) the growth of solidarity, with the corresponding change in ethical standards and release of human powers.

1. Our forefathers lived under the constant shadow of disease and death. When we consider the dangers of childbirth, the high infant mortality, the short average length of life, the constant depletion of vitality through malaria and other ailments, the epidemics which swept over the civilized world, the prevalence of war and famine, we find an explanation of the atmosphere of fear and gloom

so largely characteristic of human history. This attitude was reflected in religion. Even the Christian carved the skull and cross-bones on the graves of the departed, as a reminder of mortality. Man's earthly life was a vale of tears, a period of trial and probation. His aim was not to improve conditions, but to escape the punishment of guilt, and win the real life which was to begin in an essentially different existence.

The recent conflict may have temporarily wiped out the world's surplus. The shadows of war, famine and plague are still upon us. But we have come to realize that they are cast by clouds of man's own making, which in time may be dispelled. Under normal world conditions, the situation is vastly different from that of even two generations ago. To detect the change, let us for the moment eliminate the War, and step backward to 1912, or forward to 1932. We live, as Patten says, in an economic era of surplus rather than of deficit.[5] With the increase of the world's food supply and the improvements in transportation and exchange, the danger of starvation has been eliminated from civilized countries. We are learning how to escape the handicaps of disease and malnutrition. Human life is free to round out its development. For those whose income matches the cost of living, death is no longer a frequent and ever-expected visitor. And these outward changes are reflected in our attitude. The atmosphere of modern life, at its best, is one of cheerfulness, of enjoyment, of eager striving. We are coming to think, with Jesus, in terms of Life rather than of Death. We live in the present, and look on a future life as the continuation rather than the antithesis of the present. This change has brought us closer to the spirit of Christianity, which we have seen reason to claim as the true spirit of the Universe. It is aiding us in the great task to which we are set, of making men, of developing the possibilities inherent in human life.

[5] Simon N. Patten, *New Basis of Civilization*, 1907.

2. The most striking movement in the history of the last few centuries is the emancipation of the individual. Slavery broke down, largely because slave labor was so inefficient that it could not compete with free labor. Autocracy in industry is giving way for the same reason. The employer who must bait or drive his workmen, cannot compete with one whose workmen are conscious partners in the enterprise. The world-wide revolutionary movement of the past few years, though its outcome in Russia has been the reverse of democracy, represents the determination of the unskilled or semi-skilled laborer to assert his own will and express his own personality. It is just these classes whose instincts have been repressed or distorted. However costly the social experiments which this new freedom may bring in its train, the net result of the change must be the humanizing of industrial relations, and a development of latent and hitherto unsuspected capacities in the individual. The emancipation of woman represents a movement in the same direction.

Democracy is giving us a new viewpoint. In our theories of social organization and activity, we have not only ceased to talk about the divine right of kings, but we have ceased to talk about the right of the few to rule by virtue of their material wealth. Law and justice begin to register a change of emphasis from property rights to human rights, from privileged groups to society taken as a whole. We test situations and remedies by their effect on individual men and women. Charity is coming to merge into a larger social service, whose aim is not a dole to the unfortunate, but the cure of conditions which have proved a handicap to normal living. Our treatment of criminals is no longer punitive but corrective.

Education is feeling the effect of the same impetus. Free instruction of all children has come to be an accepted function of the state. The age of compulsory school attendance is constantly rising. The modern teacher does not aim to give a modicum of compressed information, but to develop

the personality of the child, and fit him to take part in the complex reactions and activities of adult life. Repression is giving place to the cultivation of self-expression, and a much more normal personality is the result. The spirit of Democracy is forcing a change in our conception of secondary education. Hitherto this has been thought of as the preparation of the favored few to enjoy the perquisites of leisure, while the mass, if trained at all, were trained as artisans to do the work of the world. The new Pedagogy looks on all secondary education as vocational. Each youth, whatever his parentage or his inherited capacity, is to be fitted to meet the responsibilities of citizenship, and the equally exacting demands of modern industry. The aim is to develop initiative rather than conformity, resourcefulness in new emergencies in place of a narrowly specialized skill, an appreciation of life and history rather than a narrowly classical culture.

3. The Industrial Era has brought a new social solidarity. In place of a society where the average family produced all the necessities of life, and was relatively independent of other families, we have a society whose members are engaged in specialized occupations, and dependent on one another for the supplying of their needs. "In a civilized country," writes an efficiency engineer, "we are all buying and selling service. . . . Likewise our value to the community is measured by the service we render." [6]

In former times, the Christian virtues expressed and cultivated tended to be those of a narrow individualism. With the growing inter-dependence of modern life, we are coming to appreciate Jesus' principle that the individual can reach his highest development only through association. The virtues we cultivate are social virtues. In order to live together and carry forward our common tasks, we need such qualities as consideration, honesty, justice, loyalty, social responsibility, and the spirit of service. Law and government rest today on this foundation, as do trade

[6] H. L. Gantt, *Indust. Leadership*, 1916, 18.

and banking. Practices which were regarded without scruple, even a generation ago, bankers and business men now seek to purge from their ranks.

We are beginning to look on Industry as a form of mutual service. The organization of labor represents the socializing of the laborer, not merely in his recognition of group instincts and desires, but in the responsbility for production which the most advanced labor groups are coming to assume. The new principle of compulsory insurance, by which the cost of accident (and to some extent of sickness, unemployment and old age), is borne by the industry as a whole, is bringing to the employer a new responsibility for the conditions under which production is carried on. It is in his daily tasks that man chiefly finds and develops his personality. Relieved in a measure from the incubus of industrial fear, living under wholesome conditions, inspired by a share in the direction of industrial processes, and with the machine as a servant to release him from drudgery, it will be possible for the handworker to recover the sense of joy in labor, the pride of craftsmanship, the full expression of his instincts which is essential to normal human development. The shortcomings of our industrial era—the poverty, the overcrowding, the glaring inequalities, which to a large extent may be regarded as accidents, due to the hasty and imperfect adjustment of Society to new conditions—should not blind us to the moral possibilities in social solidarity, which we have hardly begun to realize.

The growth of national inter-dependence is likewise breaking down many barriers, and raising ethical standards. The predatory nation is no longer regarded as an adventurer who needs no other credentials than success, but as an outlaw. When we compare the recent world conflict with the Thirty Years War, for example, we realize the change three hundred years have brought. Motives and methods of warfare which once were taken as a matter of course, now are condemned by the conscience of the world.

Nations are still tempted to exploit weaker peoples. But the unfavorable reactions of those exploited, and the growth of nationalist movements, are setting fatal limits to the power of the strong. Race prejudice yields slowly. Yet even this may be softened by acquaintance and sympathy, and dissolved by the principle of common interest, which, in the closely-knit world of modern intercourse, prevents any race from rising to a permanently higher economic and moral level than that of the other races with which it is in contact. The raising of belated races through the guidance and encouragement of those more fortunate, presents a well nigh limitless field for future human development.

We have found the world not a Chaos, but a unified and ordered Cosmos, to whose physical and moral laws man must adapt himself, and whose possibilities he may help make real. To belong to such a Cosmos makes life supremely worth living, whatever its incidents or accidents. To discover the laws of a Christian Universe is our duty and our right. The highest and most comprehensive of all vocations is to be a partner with God in the making of men.

APPENDICES

APPENDIX A.

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APPENDIX B.

RECENT PROGRESS IN COSMOGONY.

The sky may be divided into two general regions: the Milky Way, disk-like in form, but with irregular protuberances, a "heterogeneous assemblage" of gaseous clouds, open clusters and star streams; and the extra-galactic region, sparsely filled with open and globular clusters and spiral nebulæ.

According to Arrhenius,[1] fine particles of matter, carrying a negative electric charge, are driven out by the sun and other hot bodies. The cold and comparatively motionless nebulæ, which occupy a large portion of the galactic region (the dark nebulous tracts first discovered by Barnard), collect most of this cosmic dust. The resulting accumulation of negative electricity causes electrons to be ejected, which render luminous the gaseous envelope of the nebula. Atoms of the lighter gases are also carried out into space. The outer layer of the nebula, thus rarefied, is supplied with fresh material from the interior, until this in turn becomes depleted, and the nebula condenses into a star cluster or sun. On this theory, interstellar space is constantly being fed with star dust, which in time will be gathered by existing stars or formed into new ones. Through the balance of attractive and repulsive forces, the evolution of the heavenly bodies will continue in an endless cycle.

Jeans has approached the problem from the behavior of gaseous masses. His general conclusion is as follows:[2]

[1] *World in the Making*, 1908.

[2] J. H. Jeans, *Prob's of Cosmogony and Stellar Dynamics*, 1919, 288.

"Some hundreds of millions of years ago all the stars within our galactic universe formed a single mass of excessively tenuous gas in slow rotation. As imagined by Laplace, this mass contracted owing to loss of energy by radiation, and so increased its angular velocity until it assumed a lenticular shape. . . . After this, further contraction was a sheer mathematical impossibility and the system had to expand. The mechanism of expansion was provided by matter being thrown off from the sharp edge of the lenticular figure, the lenticular centre now forming the nucleus, and the thrown-off matter forming the arms, of a spiral nebula of the normal type. The long filaments of matter which constituted the arms, being gravitationally unstable, first formed into chains of condensations about nuclei, and ultimately formed detached masses of gas. With continued shrinkage, the temperature of these masses increased until a large proportion of them broke up by fission into binary systems. The majority of the stars broke away from their neighbors and so formed a cluster of irregularly moving stars—our present galactic universe, in which the flattened shape of the original nebula may still be traced in the concentration about the galactic plane, while the original motion along the nebular arms still persists in the form of 'star-streaming.' In some cases a pair or small group of stars failed to get clear of one another's gravitational attractions and remain describing orbits about one another as wide binaries or multiple stars. The stars which were formed last, the present B-type [Helium] stars, have been unusually immune from disturbance by their neighbors, partly because they were born when adjacent stars had almost ceased to interfere with one another, partly because their exceptionally large mass minimised the effect of such interference as may have occurred; consequently they remain moving in the plane in which they were formed, many of them still constituting closely associated groups of stars—the moving star-clusters."

Russell's two-branch theory and Eddington's recent studies have thrown new light on the life history of the stars. In the diffuse or youthful stage, the effective temperature rises as the surface contracts, the total luminosity remaining unaltered. The star is first red, then in succession orange, yellow and white. The radiating surface of the Hydrogen stars has a temperature of about 11,000° C., and that of the Helium stars 15,000°. Only the largest or "giant" stars are sufficiently massive to reach this point. The temperature at the interior must be millions of degrees.[3] The greatest effective temperature is reached when the density is from one fifth to two fifths that of water. From this point the temperature declines, and the luminosity falls off rapidly, the star passing through a descending series of yellow, orange, red, until it becomes dark and cold. Differences in brightness, as well as in the maximum stage of evolution attained, must be attributed to differences in mass. The range in mass is remarkably small. To reach the hottest stage, a star must be two and a half times as massive as the sun, which shows at present about 6000°, and may at one time have reached 9000°. Some few are known which are perhaps fifty times as large as the sun. A body with mass less than one seventh that of the sun would never reach 3000°, the lowest temperature admissible if it is to shine as a star. No star as small as this has yet been found. A mass range of 1 to 3 would include five sixths of all the known stars. Eddington's conclusion is that most of the material in the universe has been aggregated into stellar bodies of fairly uniform size. A star much larger than the average would tend to be unstable; the radiation pressure

[3] H. N. Russell, *Pub's of Astron. Soc. of Pac.*, Aug., 1919. He suggests that hitherto unsuspected forms of energy may be developed at such temperatures, giving the giant stars a much longer life than the ordinary laws of matter would allow. *Cf.* note by Shapley, *id.*, June, 1919, and Eddington, *Observatory*, Oct., 1919. Russell's original papers are in *Observatory*, 36, 324, 1913; 37, 165, 1914.

would become so great that gravitation could not hold it together.[4]

The Carnegie observatory on Mount Wilson, in southern California, has recently used its 60-inch reflector for epoch-making discoveries as to the extra-galactic region and its relation to the Milky Way.[5] Dr. Seares, the director of the photometric division, was able to establish definite color and magnitude scales for the fainter stars. A type of variable stars, with a peculiar pulsating light, the Cepheid variables, have long puzzled astronomers. They are usually associated with the equally puzzling globular clusters, of which some 86 are now known. Working from the observed similarity of these Cepheid variables in magnitude, spectrum and color, Shapley was able to determine their relative distances, and so the distances of the globular clusters containing them. The results are so amazing that it takes one a little time to catch one's breath. The Galaxy, which we used to place at a maximum distance of about 3000 light years, now is extended in some directions to between 120,000 and 180,000 light years. Globular clusters extend still further. While the nearest is only 21,000 light years from us, the most distant known at present (New General Catalogue 7006) is at a distance of 220,000 light years. The spiral nebulæ, of which Keeler and Perrine, at the Lick observatory, detected about half a million, are comparable in distance.

The globular clusters occupy a wedge-shaped region at one side of the Milky Way, and divided into about equal parts by the plane of the Galaxy. They appear to be moving toward the Milky Way, which they closely approach, the nearest globular clusters being in general the least condensed. The spiral nebulæ, on the contrary, are moving away from the Galaxy with great velocity, and come near-

[4] A. S. Eddington, *Scientia*, 23, 9, 1918.

[5] The work of the newly installed 100-inch reflector is being watched by the astronomical world with keen anticipation.

est to it on the opposite side. Here also are most of the open clusters found outside of the Milky Way.[6] Shapley's provisional hypothesis is that "the discoidal galactic system originated from the combination of spheroidal star clusters and has long been growing into its present enormous size at their expense. The evidence further suggests that the galactic system now moves as a whole through space, driving the spiral nebulæ before it and absorbing and disintegrating isolated stellar groups. Apparently the suggested interpretation requires that two types of sidereal organization prevail generally throughout extra-galactic space: spiral nebulæ, and stars of known types assembled for the most part into globular clusters; and while the globular clusters now known are, at least potentially, members of the galactic system, the spiral nebulæ are not members, being rather general inhabitants of extra-galactic space. The hypothesis demands that gravitation be the ruling power of stars and star clusters, and that a repulsive force, radiation pressure or an equivalent, predominates in the resultant behavior of spiral nebulæ." It is possible that spiral nebulæ represent a failure to form stars by condensation, because of an excess of material. "The mean diameter of the proposed system appears to be at least 300,000 light years; its most conspicuous feature is the equatorial segment, which apparently is thickly populated with stars throughout its whole extent. From this viewpoint the Milky Way is mainly a phenomenon of depth." [7]

[6] In both cases the radial velocity may be only apparent. See Russell, *Ap. J.*, 53, 1, 1921.

[7] *Studies based on Colors and Magnitudes in Stellar Clusters*, 14th paper, *Ap. J.*, 50, 107, 1919; *N. Acad. of Sciences*, 4, 224, 1918.

APPENDIX C.

HABITABLE PLANETS AMONG THE STARS?

The only stars to be considered are those of the Solar type. If we assume that there are 1000 million bright stars, and that one fourth belong to this class, we have 250 million specimens to consider. According to Eddington's theory, most of these will have a mass comparable with the sun. Binary stars must be excluded, as subject to intense tides; Aitken estimates these at two fifths of the entire number. Conditions are likely to be equally unstable for multiple stars, and those associated with nebulæ and globular clusters. Since our entire region is galactic, we need no longer follow Wallace in excluding the stars in the Milky Way. Confining attention to open clusters like our own, we are left with perhaps 50 million stars. The question is, How many of these have developed planetary systems? And that brings us to the perennial problem of the way planetary systems are formed.

In order to advance at all, let us adopt the late Professor Barrell's modification of the planetesimal hypothesis.[1] According to this theory, a star decidedly larger than our sun approached it and raised large tidal protuberances, which shot off one or two streams of matter. The attraction of the passing body gave to the parts of this material a direct revolution around the sun, the whole taking the form of a spiral nebula. The arms of this nebula included several large nuclei, which ultimately formed the planets. The rest of the material condensed rapidly into smaller solid bodies, called planetesimals. Over 800 such bodies

[1] Jos. Barrell, in *Evol. of the Earth*, 1918, lecture 1. A similar view is given by Harold Jeffreys, *Sci. Prog.*, 12, 52, 1917.

have been discovered. Most of them however were picked up by the larger nuclei in their subsequent development. The planets grew very much by these accretions, and at the same time reduced the eccentricity of their orbits.

If such an accident has occurred in the life of one Solar star, it may occur in others. The possibility of actual collision is practically negligible. Even close encounters must be of rare occurrence. At the average speed of 26 miles per second, Kapteyn's estimate of stellar density requires 100,000 years merely to cover the distance from one star to another. The chance of close approach for any star has been estimated at one in 1800, in a period of a billion years; or one chance in 18,000, if we take the 100 million years assigned for the existence of life on our earth. This would reduce our 50 million available stars to a little over 2000. Of the encounters which might take place, only a very small proportion would duplicate the conditions of the hypothesis, as to the mass of the approaching star, the closeness of approach, the amount of material driven out by tidal action, and the resulting motions in the spiral nebula. Of the planetary systems thus formed, not all would furnish a planet with the conditions found on our earth. Any other set of assumptions would be likely to bring us much the same result.

APPENDIX D.

THE EMERGENCE OF A NEW SPECIES.

A new species arises in a number of different ways. It may represent a blending of the factors present in the two types that are crossed, as in the loganberry. Burbank states that in Central America the *Western Blackcap* and *Eastern Red Raspberry* sometimes form a natural cross. More frequently the blended factors in the hybrid will segregate in their progeny, and appear in various new combinations, which breed true. These form the raw material out of which the breeder makes other desired combinations. Most of our new domestic species have been formed in this way, and something of the same process must be going on in wild forms. Factors may be cumulative in their effect, causing the gradual accentuation of certain features, as in Nilsson-Ehle's work with oats, two dark browns producing a blacker pigment than one. Smith in Illinois was able to increase or diminish the protein-content or oil-content of maize, and Castle the color-markings of hooded rats. Again, absolutely new factors arise from time to time. Organisms appear which differ from their parents, perhaps in a number of features. The mutation may be large, as in the sudden appearance of the White Plymouth Rock fowl, in 1875. It may be exceedingly minute, as in the variations of the fruit-fly *Drosophila,* or in Jennings' studies of the rhizopod *Difflugia.* The mutation may represent the dropping out of a factor. The essential thing is the obtaining of a feature which has so affected the germ of the organism that it will be inherited, and thus become available for breeding and further selection. Commercial breeders are constantly on the lookout for favorable variations.

APPENDIX E.

CHEMISTRY AND THE ORGANISM.

The chromosomes of the germ-cell nucleus have been found to segregate in exactly the same way as the hypothetical factors. In fact Morgan, in his study of linked factors and their interference, has been able to lay off the chromosomes of the *Drosophila* on an exact linear scale. His preliminary estimate is that 7500 different factors are involved, for the four chromosomes of this species.[1] It is evident that chromatin has some close relation to heredity. Some biologists question whether the chromosomes themselves are to be considered as causes, and the seat of individual "determiners," or whether they are consequents of chemical changes in the germ-cell as a whole, and "a useful superficial index" of such changes.

The proteins, starches and other fundamental constituents of the cell, show a composition and structure that are "peculiarly and specifically modified in relation to genus, species, variety, sex, individual or even part of an individual." [2] With a germ-plasm of such molecular complexity, it is easy to imagine the alteration of the equilibrium through slight changes in the internal or external conditions of the organism, causing the "physico-chemical fatality" of normal reproduction to give place to mutations. The probability of recombination will be greatly increased by cross-fertilization.

[1] T. H. Morgan, *Critique of the Theory of Evolution*, 1916, 143.

[2] E. T. Reichert, *Science*, 40, 649, 1914. The species relationships of over 100 animals were accurately determined by the crystal structure of molecules of hemoglobin. This "individuality-differential" must be reckoned with in the transplanting of tissues; see Leo Loeb, *Am. Naturalist*, 54, pp. 45, 55, 1920.

Every change in the germ cell, as reflected in the altered form and behavior of the organism, must be considered to be due to some physical or chemical cause, rather than to chance. Experimental work has shown that the development of inherited characters may be modified by changes in light, temperature, food and moisture. And the production of new characters by external stimuli, while not yet demonstrated, has reached the stage of circumstantial evidence.[3]

The physico-chemical nature of the organism is reflected in the recent literature of Biology. D'Arcy Wentworth Thompson, for example, has traced the part played by physical stresses in the interaction of growth and form.[4] E. G. Hopkins emphasized in illuminating detail the dynamic side of biochemistry, up to a few years ago.[5] The feeding experiments of Mendel and Osborne show that, of the amino acids out of which the mammalian proteins are built, lysine is essential to growth, and tryptophane to body maintenance.[6] We might extend almost indefinitely our examples of this physico-chemical approach to the problem of the organism.

[3] A good summary will be found in E. B. Babcock and R. E. Clausen, *Genetics in Rel. to Agriculture*, 1918, 21 *ff.* Ellsworth Huntington, *World-Power and Evolution*, 1919, chap. 9, discusses variation due to climatic changes, and its relation to geologic history.

[4] *Growth and Form*, 1917.

[5] *Nature*, 92, 213, 1913.

[6] Frank P. Underhill, *Physiol. of the Amino Acids*, 1915.

APPENDIX F.

THE EVOLUTION OF THE ORGANIC MACHINE.

The earliest stage in organic evolution is that of Bacterial Life. Certain types of bacteria, still present in the soil, are able, under the influence of moderate heat, to capture the electrical energy of chemical elements. Oxygen is drawn in through the attraction of some of the molecules of the cell. By means of certain catalysts, or intermediate chemical compounds, the ammonia present in the soil is oxidized, the end products being nitrous acid, water and heat. The nitrous acid is of no value to this organism, though it is in turn oxidized for the production of energy by companion bacteria of another type. But the heat liberated supplies the energy by which the first organism, through its catalysts, builds up its own cell out of ammonia, carbon dioxide and various minerals. Bacteria which are able to work without free oxygen may represent a still more primitive type.

Step by step new molecules were formed, which made possible the performance of other chemical functions. New sources of chemical energy were utilized, such as iron and sulphur compounds. In later stages, many of the bacteria became parasitic, depending on plants or animals for the elaboration of their food material. Some special enzymes were developed, for breaking up organic compounds. The organism began to show the cell-wall, nucleus and chromosomes of the typical cell. For millions of years, however, the simpler forms of bacteria were the earth's only inhabitants. Through their work in soil formation, and the provision in themselves of an organic food supply, they prepared the way for more complex energy transformers.

A second but still extremely primitive stage in Evolution is that of the Algæ. By the acquirement of chlorophyll granules, the organism is able to capture the energy in certain of the sun's rays. This is used to break up molecules of carbon dioxide and water, and build the deoxidized carbon and hydrogen atoms into the energy reserves which we know as carbohydrates. These reserves are later oxidized, to supply the energy needed for life processes. "Thus living matter," as Osborn puts it, "utilizes the energy of the sun to draw a continuous stream of electric energy from the chemical elements in the earth, the water, and the atmosphere." Many of the algæ are floating or free swimming. They constitute with bacteria the food supply of the earliest animals.

The world of Plants represents further organizing of this original function: the transformation of solar energy by means of chlorophyll. "In their evolution, while there is a continuous specialization and differentiation of the modes of obtaining energy, plants may not attain a higher chemical stage than that observed among the bacteria and algæ, except in the parasitic forms which feed both upon plant and animal compounds. In the energy which they derive from the soil plants continue to be closely dependent upon bacteria, because they derive their nitrogen from nitrates generated by bacteria and absorbed along with water by the roots. In reaching out into the air and sunlight the chlorophyllic organs differentiate into the marvellous variety of leaf forms, and these in turn are supported upon stems and branches which finally lead into the creation of woody tissues and the clothing of the earth with forests. Through the specialization of leaves in connection with the germ-cells flowers are developed, and plants establish a marvellous series of balanced relations with their life environment, first with the developing insect life, and finally with the developing bird life." [1]

The fourth stage is that of Protozoa, or one-celled ani-

[1] Osborn, *op. cit.*, 105.

mals, which normally derive their energy from the bacteria or algæ on which they feed. The utilization of these energy stores is made possible by their equipment with the proper enzymes or other catalysts. In the highest types, such as Jennings' *Difflugia,* the cell shows a highly complex organization, and is protected by a shell of cemented sand granules. The organism moves about in the water in response to light or chemical attraction, and shows considerable power of experiment and discrimination.

Metazoa, or many-celled animals, constitute the fifth stage. Their energy supplies continue to be drawn from other organisms, chiefly from green plants.

Fossil remains show that by the middle of the Cambrian period, perhaps 45 million years ago, the Invertebrates had spread over practically all water areas. Their adaptation to various conditions of life "appears to have been governed by mechanical and chemical principles fundamentally similar to those observed among the Protozoa, but distributed through myriads of cells and highly complicated tissues and organs, instead of being differentiated within a single cell as in the ciliate Protozoa. Among the elaborate functions thus evolved, showing a more complicated system of action, reaction, and interaction with the environment and within the organism, were, first, a more efficient locomotion in the quest of food, in the capture of food, and in the escape from enemies, giving rise in some cases to skeletal structures of various types; second, the evolution of offensive and defensive weapons and armature; third, various chemical modes of offense and defense; fourth, protection and concealment by methods of burrowing." [2]

We now reach the stage of Evolution, where "the supremely adaptable Vertebrate type begins to dominate the living world, overcoming one mechanical difficulty after another as it passes through the habitat zones of water, land and air. Adaptations in the motions necessary for the capture, storage, and release of plant and animal

[2] *Id.,* 119.

energy continue to control the form of the body and of its appendages, but simultaneously the organism through mechanical and chemical means protects itself either offensively or defensively to reproduce and protect its kind." [3] Sense organs become highly developed, and the parts of the organism are correlated through internal secretions, enzymes, and the fully organized nervous system. "In the course of normal physicochemical environment, of normal life environment, of normal individual development, and of normal selection and competition, an organism will tend to more or less closely reproduce its normal ancestral characters. But a new or abnormal physicochemical intruder either into the environment, the developing individual, the heredity-chromatin or the life environment may produce a new or abnormal visible character type." [4]

[3] *Id.*, 152.
[4] *Id.*, 147.

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